

**U.S. Department of the Interior  
Bureau of Land Management**

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**Big Springs Assessment  
Sierra Del Rio Use Area  
September 12, 2014**

U.S. Department of the Interior  
Bureau of Land Management  
Bruneau Field Office  
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## Sierra Del Rio

### Livestock Management

#### **Allotment and Pasture Boundaries**

Pasture 7 of the Big Springs Allotment (#0803) is designated as the Sierra Del Rio (SDR) Use Area. This Use Area is fenced off from the remainder of the Allotment and is managed independently. Rimrocks and gap fences sub-divide Pasture 7 into four Pastures: 7N, 7NC, 7, and 7S (Figure 1).

#### **Season of Use, Grazing System, and Phenological Events**

The season of use for each pasture in the SDR Use Area is not restricted under the current grazing permit; nor was it reported by pasture before 2005. The existing permit does not specify a particular grazing system. Cattle generally start the grazing season in the south portion of the allotment in 7S in early May and finish in the north portion of Pasture 7N in early October. The timing of pasture movements northward through Pastures 7 and 7NC are generally based on grass phenology and availability of water. No complete pastures have been rested as part of the yearly management.

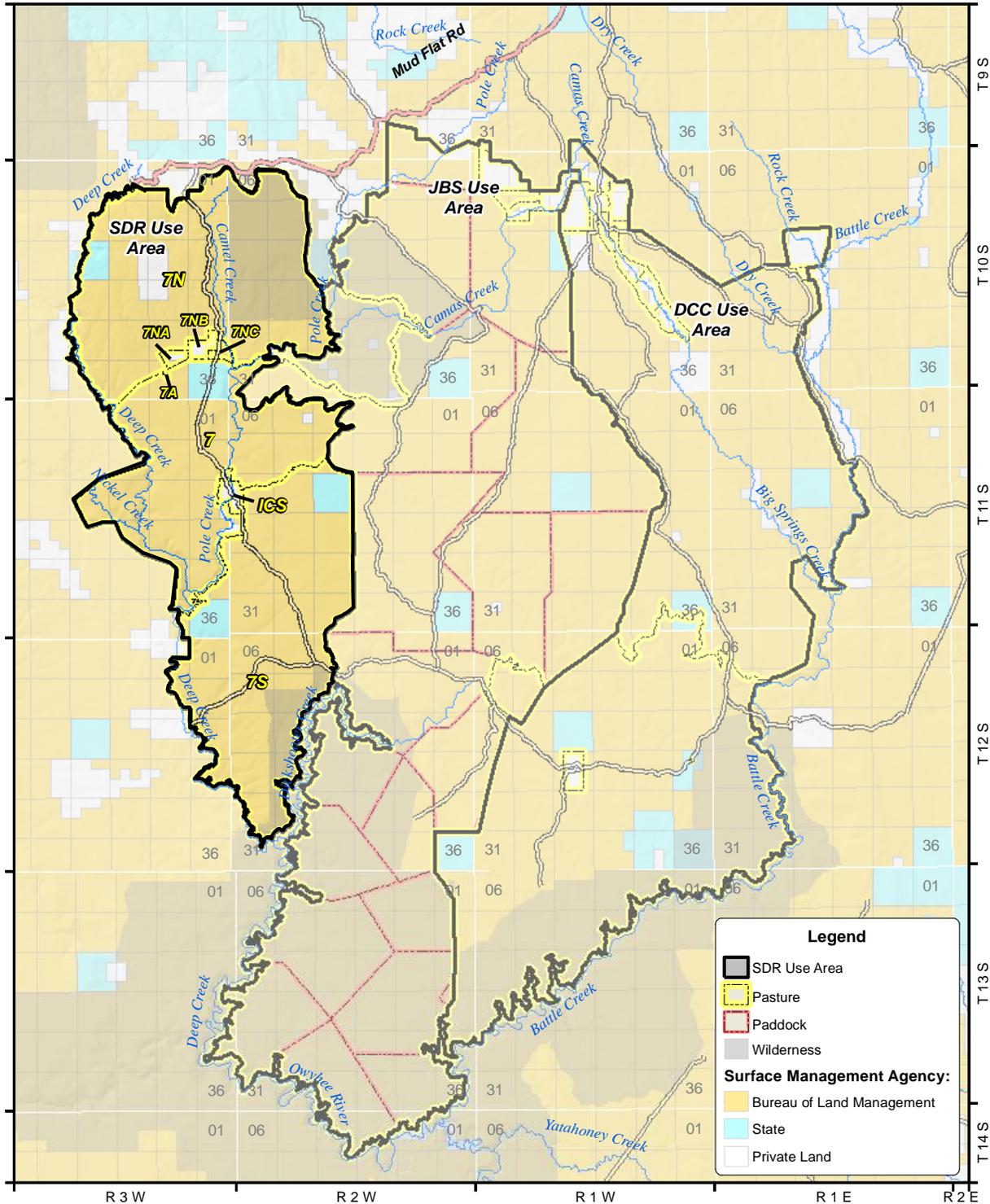
The total available AUMs for all pastures are 3,343 AUMs; 3,021 AUMs are for public lands and 322 AUMs are authorized under an Exchange-of-Use (EOU) agreement for private and state lands.). Actual/licensed use ranged between a low of 1,469 AUMs in 1991 and a high of 3,447 AUMs in 1987. The average use was 2,920 AUMs between 1990 and 2013 (Table 1). Permitted nonuse for the SDR Use Area averaged 101 AUMs (3%) from 1990 to 2013. In dry years, the permittee has not turned out the additional cattle authorized by EOU.

When averaged across the use area, the heaviest stocking rate during 1987 to 2013 was 14.0 acres/AUM, which occurred in 1987. Individual pasture stocking rates are as follows:

Pasture 7S has been stocked at 17 to 26.9 acres/AUM.

Pasture 7 has been stocked at 9.5 to 24.8 acres/AUM.

Pastures 7N and 7NC have been stocked at 11.1 to 19.6 acres/AUM.



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Figure 1. Use Area for Del Sierra Rio (SDR).

**Table 1. Actual/Licensed Livestock Use, Pastures 7S, 7, and 7N and the entire Use Area (7-all) Sierra Del Rio Use Area, Big Springs Allotment.**

| Pasture | 7S   |           |            | 7    |           |            | 7N   |           |            | 7-all |           |            |
|---------|------|-----------|------------|------|-----------|------------|------|-----------|------------|-------|-----------|------------|
| Year    | AUMs | Max #LVST | Use Period | AUMs | Max #LVST | Use Period | AUMs | Max #LVST | Use Period | AUMs  | Max #LVST | Use Period |
| 1987    | 1928 | 600       | 4/6-7/15   |      |           |            |      |           |            | 3447  | 600       | 4/6-9/30   |
| 1988    |      |           |            |      |           |            |      |           |            | 2814  | 534       | 4/15-9/30  |
| 1989    |      |           |            |      |           |            |      |           |            |       |           |            |
| 1990    |      |           |            |      |           |            |      |           |            | 3005  | 601       | 5/1-9/30   |
| 1991    |      |           |            |      |           |            |      |           |            | 1469  | 244       | 5/1-10/30  |
| 1992    |      |           |            |      |           |            |      |           |            | 2093  | 400       | 5/1-10/13  |
| 1993    |      |           |            |      |           |            |      |           |            | 2501  | 495       | 5/1-10/15  |
| 1994    |      |           |            |      |           |            |      |           |            | 2728  | 608       | 5/1-10/15  |
| 1995    |      |           |            |      |           |            |      |           |            | 3227  | 600       | 5/1-10/15  |
| 1996    |      |           |            |      |           |            |      |           |            | 3042  | 606       | 5/3-10/15  |
| 1997    |      |           |            |      |           |            |      |           |            | 3305  | 645       | 5/1-10/15  |
| 1998    |      |           |            |      |           |            |      |           |            | 3023  | 582       | 5/1-10/15  |
| 1999    |      |           |            |      |           |            |      |           |            | 3339  | 650       | 5/1-10/15  |
| 2000    |      |           |            |      |           |            |      |           |            | 3018  | 663       | 5/5-10/01  |
| 2001    |      |           |            |      |           |            |      |           |            | 3023  | 570       | 5/1-10/15  |
| 2002    |      |           |            |      |           |            |      |           |            | 3028  | 580       | 5/1-10/15  |
| 2003    |      |           |            |      |           |            |      |           |            | 3028  | 580       | 5/1-10/15  |
| 2004    |      |           |            |      |           |            |      |           |            | 2898  | 554       | 5/1-10/15  |
| 2005    | 722  | 372       | 5/3-6/30   | 934  | 613       | 5/23-7/31  | 1364 | 553       | 8/1-10/14  | 3021  | 613       | 5/3-10/14  |
| 2006    | 629  | 375       | 5/11-6/30  | 1035 | 610       | 5/2-7/31   | 1355 | 542       | 8/1-10/15  | 3019  | 610       | 5/2-10/15  |
| 2007    | 817  | 407       | 5/1-6/30   | 870  | 602       | 5/22-7/31  | 1345 | 538       | 8/1-10/15  | 3032  | 602       | 5/1-10/15  |
| 2008    | 726  | 362       | 5/1-6/30   | 990  | 629       | 5/20-7/30  | 1413 | 565       | 8/1-10/15  | 3128  | 629       | 5/1-10/15  |
| 2009    | 674  | 336       | 5/1-6/30   | 1322 | 633       | 5/18-8/15  | 1160 | 569       | 8/15-10/15 | 3156  | 633       | 5/1-10/15  |
| 2010    | 672  | 335       | 5/1-6/30   | 1078 | 441       | 5/18-8/14  | 1218 | 597       | 8/15-10/15 | 2968  | 629       | 5/1-10/15  |
| 2011    | 824  | 358       | 5/1-7/9    | 1235 | 644       | 5/23-8/15  | 1228 | 612       | 8/16-10/15 | 3288  | 644       | 5/1-10/15  |
| 2012    | 829  | 360       | 5/1-7/9    | 1371 | 659       | 5/22-8/19  | 1174 | 626       | 8/20-10/15 | 3373  | 659       | 5/1-10/15  |
| 2013    | 990  | 430       | 5/1-7/9    | 523  | 430       | 7/10-8/15  | 863  | 430       | 8/16-10/15 | 2376  | 430       | 5/1-10/15  |

Big Springs Allotment Assessment

Sierra Del Rio Use Area

|  |      |  |  |      |  |  |      |  |  |      |  |  |
|--|------|--|--|------|--|--|------|--|--|------|--|--|
|  | 1928 |  |  |      |  |  | 1520 |  |  | 3131 |  | Avg (1987-1989)<br>Bill White as<br>manager  |
|  | 765  |  |  | 1040 |  |  | 1235 |  |  | 2920 |  | Avg (1990-2013)<br>Craig Baker as<br>manager |
|  | 765  |  |  | 1040 |  |  | 1235 |  |  | 3040 |  | Avg (2005-2013)                              |

## **Utilization and Use Pattern Mapping**

Both use pattern mapping and utilization data are available for the SDR use area. Use pattern mapping has been conducted more often than utilization transects as this data shows the level and pattern of livestock use for the landscape as a whole.

Many of the sites where heavy utilization was noted are adjacent to water, along fences, near salt grounds, and within plant communities preferred by livestock. Use pattern mapping was used to put these heavy use areas into the context of use over the entire area. The following sections describe use history by pasture.

### ***Pasture 7S***

Based upon use pattern mapping data (Figure 2), the following use patterns are apparent. The majority of Pasture 7S consistently receives no or slight use. Cattle concentrate on fine-soiled, non-stony areas in small closed basins and on stream terraces, tableland escarpments, and adjoining toe slopes. Low mounds of fine soil that support low sagebrush communities that are intermingled with basin big sagebrush communities are preferred by cattle. Less preferred are the larger surrounding areas of intermound soils that support low sagebrush communities. Loamy, Churning Clay, Clayey, and riparian ecological sites are the most preferred communities.

The seasonality of water availability restricts the season of use of much of Pasture 7S. Pole Creek near the Indian Crossing base property and Deep Creek near the Wiseman Field are the most reliable water sources. Beaver and Chief Joseph Reservoirs impound runoff in intermittent drainages and serve as focal points for cattle use at the north end of Pasture 7S. In May, water may also be available from pools or in small, wet meadows associated with springs that occur at intervals along intermittent stream channels, particularly along Lightning Creek, Bull Gulch and Cowboy Creek. In poor snowpack years, such as occurred in 2002-2003, inadequate water is available to fill dependent reservoirs or to maintain spring or stream flow later in spring.

While limited utilization data is available for this pasture, the overall utilization was 17% in 2000 and 11% in 2005 and 2006.

### ***Pasture 7 (Late Spring/Early Summer Use)***

Based upon use pattern mapping data (Figure 2), the following use patterns are apparent. The majority of Pasture 7 consistently receives no or slight use. Cattle concentrate on fine-soiled, non-stony areas in closed basins, and on stream terraces, tableland escarpments, and adjoining toe slopes. Shallow Claypan sites predominate on those portions of the landscape and are generally non-stony. Loamy, Churning Clay, and riparian ecological sites are the most preferred communities.

The seasonality of water availability restricts the season and influences the pattern of use in Pasture 7. Cattle can access Pole Creek in a few places; and Dry Lake Spring and the drainage below it provide reliable water within the main key area in Pasture 7. Reliable water is also available at springs in Antelope Basin. Bower, Olsen, Indian Crossing, Battleground and Hereford Reservoirs impound runoff in intermittent drainages; and additional water may also be available in pools along intermittent streams in some years. In poor snowpack years, such as occurred in 2002-2003, inadequate water is available to maintain spring or stream flow or to fill dependent reservoirs in the uplands.

Limited utilization data is available for this pasture. Overall utilization for the pasture was 12% in 2000, 6% in 2005, and 13% in 2006.



***Pastures 7N and 7NC (Summer Use)***

Based upon use pattern mapping data (Figure 2), the following use patterns are apparent. The majority of Pasture 7N receives no use. Cattle concentrate on fine-soiled, non-stony areas in closed basins, and on stream terraces, tableland escarpments, and adjoining toe slopes. Churning Clay, Clayey, Loamy, and riparian ecological sites predominate on those portions of the landscape.

Water may be available in the form of springs and pools along intermittent streams, particularly Camel Creek. Avery Reservoir is also an important water source within preferred use areas around the Lower Avery and Sunshine Valley properties in 7N and 7NC.

Avery Table in the northeast part of Pasture 7N is exceptionally stony and receives little cattle use. The D Bar Reservoir impounds seasonal runoff in an intermittent drainage within the largest closed basin and serves as the focal point for livestock use on Avery Table. Slack Mountain is rugged with shallower soils and receives little use. Several developed and undeveloped springs are the major water sources on Slack Mountain.

Limited utilization data is available for these two pastures. Overall utilization for pasture 7NC was 66% in 2000, 6% in 2005, and 72% in 2006. Pasture-wide utilization for 7N was not measured in 2000, was 6% in 2005 and unmeasured in 2006.

**Standard 1: Watersheds****Pastures 7N and 7NC (Summer Use)*****Rangeland Health Evaluations***

A total of 15 Rangeland Health Evaluations were completed in Pasture 7N between July 4 and September 4, 2004. Claypan, Stony Clayey, and Clayey ecological sites predominate in these pastures. Many of the Stony Clayey and Claypan stands have stony to extremely stony surfaces which aid in protecting them from disturbance.

On Slack Mountain, Claypan ecological sites intermingled with Loamy inclusions that support big sagebrush communities predominate. Shallow Breaks 14-18" ecological sites that normally support scattered juniper are also present. Some Claypan stands have lower production potential (concave intermound), and species typical of shallower and drier sites are more prominent (Sandberg's bluegrass, Thurber needlegrass). Convex intermound Claypan stands have slightly deeper soils, and support the dominant species from the site guides. Low mound Claypan soils are deeper still, usually support Idaho fescue, and have higher potential production. Water flow or accumulation areas typically have Sandberg bluegrass and oatgrass if too dry to support dependent riparian species.

On Avery Table, Stony Clayey and Clayey ecological sites predominate, which differ primarily in the amount of rock contained in soil horizons, and show associated differences in production. Churning Clay ecological sites typically occur in association with Clayey sites as inclusions in basin bottoms and along drainages where water accumulates in spring. They are particularly subject to frost heaving and cracking. Water flow or accumulation areas also typically have Sandberg bluegrass and oatgrass if too dry to support dependent riparian species. Loamy inclusions which support big sagebrush communities typically occur on associated tableland escarpments.

The 2004 data indicated none to a slight departure as a whole for the site stability and watershed function-related Indicators within Pasture 7N (Table 2). Evaluations in the north end on both tables and structural benches showed little departure from reference condition, but those on Slack Mountain

showed western juniper encroachment. A Loamy RHE near Avery Reservoir (10S03W26) exhibited more departure than others. Some (10S02W07A, 10S03W03) were close to reference condition. Two evaluation areas (10S03W24, 10S03W12A) within Pasture 7N were reevaluated in 2012; both showed little departure from reference condition. Biomass on both was much higher in 2012 after several normal or wet years than in 2004 after several successive dry years, with little evidence of mortality on bunchgrasses. Pasture 7N has been grazed primarily after seed ripe since 1987.

An additional evaluation area was examined in Pasture 7NC in 2012, with slight to moderate departure from reference condition. This small field was grazed in conjunction with adjoining base properties in the past and now is grazed primarily during cattle movements in spring and fall.

**Table 2. Summary of upland data<sup>1</sup> collected in Pastures 7N and 7NC, Sierra Del Rio Use Area, Big Springs Allotment, 2004 and 2012.**

| Ecological Site       | Location  | RHE Condition <sup>1</sup><br>Watershed | RHE Comments   |
|-----------------------|-----------|---|--|
| Shallow Breaks 14-18  | 10S03W12B | N-S                                     | Abundant rock and vegetation cover. Some active pedestalling with root exposure.                             |
| Churning Clay 12-16   | 10S02W07C | N-S                                     | Minimal soil loss observed.  |
| Stony Clayey 12-16    | 10S02W18  | N-S                                     | Site is stony and well protected hydrologically.   |
| Stony Clayey 12-16    | 10S02W07B | N-S                                     | Well armored with rock and gravel. Adequate grass cover to deflect flow.                                     |
| Clayey 12-15          | 10S02W07A | N-S                                     | Adequate litter and vegetation cover help stabilize soils.   |
| Loamy 13-16           | 10S03W12A | N-S (2004)                              | Site is stabilized by gravel, litter, and vegetation.  |
|                       |           | N-S (2012)                              | No comments  |
| Shallow Breaks 14-18  | 10S03W12B | N-S                                     | Very well armored with rock and gravel. High biocrust and litter under juniper.                              |
| Loamy 13-16           | 10S03W03  | N-S                                     | Soils are stabilized by vegetation cover and some gravel.  |
| Loamy 12-16           | 10S03W26  | N-S                                     | Soils are stabilized by abundant vegetation cover. Soil degradation observed from trailing and hoof impacts. |
| Shallow Claypan 12-16 | 10S03W24  | S-M (2004)                              | Bare areas show signs of degradation through hoof shearing and imprints.                                     |
|                       |           | N-S (2012)                              | Soil degradation noted near road and associated with trailing.   |
| Shallow Claypan 12-16 | 10S03W12  | N-S                                     | Mechanical damage, slight bunchgrass mortality, physical crust   |

| Ecological Site  | Location  | RHE Condition <sup>1</sup> Watershed | RHE Comments  |
|--|-----------|--------------------------------------|---|
| Shallow Claypan 12-16  | 10S02W29A | S-M                                  | Flow paths and cut areas more common than expected. Pedestals common.   |
| Shallow Claypan 12-16  | 10S02W29B | N-S                                  | Abundant rock and gravel stabilizes this site. Interspace grass cover less than desired for obstructing flow. |
| Shallow Claypan 12-16  | 10S03W21  | N-S                                  | Site overall stable but with active pedestalling.   |
| Shallow Claypan 12-16  | 10S03W33  | N-S                                  | Gravel in interspaces stabilize soils. Pedestals and hoof shearing of grasses noted.                          |
| Shallow Claypan 12-16  | 10S03W22  | N-S                                  | Abundant gravel stabilizes site. Pedestals present.   |
| Shallow Claypan 12-16  | 10S03W25  | S-M (2012)                           | Pedestalling is common and roots are exposed. Litter movement noted.  |
| <sup>1</sup> N-S = none-slight departure from reference conditions, S-M = slight-moderate departure from reference conditions, M = moderate departure from reference conditions, M-E = moderate-extreme departure from reference conditions. |           |                                      |   |

The dominant indicators of **soil erosion** processes were flow patterns and pedestalled plants (Indicators 2 & 3), indicating if present that soil loss and degradation has occurred in shrub interspaces. Most indicators showed only slight to moderate departure from reference condition, and erosion processes were historic in Pasture 7N. The amount of bare ground showed slight to moderate departure from reference condition at most on all RHE areas, with sufficient stone cover and adequate litter to provide surface protection. Although mechanical damage from hoof shearing was documented on several evaluation areas, active pedestalling was rare. Evaluation areas on Avery Table and the Shallow Breaks stand in Cougar Canyon were all close to reference condition with little sign of active or historic erosion.

In Pasture 7NC, portions of the 2012 evaluation area dominated by increaser grasses showed slight active pedestalling, with associated flow patterns and accumulation of small sized litter.

Soil factors affecting **hydrologic function** are adequate if there is good soil structure and sufficient organic matter in surface horizons and desirable shrub, forb, and bunchgrass species occupy the surface; particularly if decreaser bunchgrass species are common in shrub interspaces. Shearing and other forms of mechanical damage to the soil can also lead to surface sealing, compaction, and formation of a physical crust when they occur on wet clayey soils. Soil factors affecting the hydrologic function at most areas were adequate.

However, in 2004 Indicator 10 at RHE 10S03W24 reflected an imbalance of decreaser to increaser species and fewer decreaser bunchgrasses than expected in shrub interspaces. Step-point data was not collected at this site until 2012 therefore no chart could be made. In 2012, step-point basal cover at that RHE revealed only 10% bare ground, 26% decreaser grasses and 31% increaser grasses, reflecting alternating dominance of both groups on portions of the evaluation area. On a similar stand where basal cover was monitored on the other side of Camel Creek (10S02W29A), strong upward trend in increaser grasses, non-persistent litter and biocrust and a decline in bare ground were evident during the same interval. Rangeland Health Evaluations are a one-point-in-time judgment, which influences some

indicators at the time of evaluation more than others. Even so, differences in current condition are still evident, particularly among evaluation areas in different pastures. While vegetative cover also shows some fluctuation among readings at trend studies, a significant change has longer lasting effects on site protection than short-term fluctuations in the amount of litter or bare ground. Bunchgrasses are typically the largest basal cover component in monitored stands.

Frequency and basal cover data were collected at two long-term trend sites in Pasture 7N between 1983 and 2012. Site 10S02W07 is located in a very stony area on Avery Table, while intermounds, low mounds, and rubbleland are intermingled at trend site 10S02W29A near Spencer Butte; representing the Stony Clayey 12-16 ecological sites and the Shallow Claypan 12-16 ecological sites, respectively. An evaluation area was co-located with 10S2W29A.

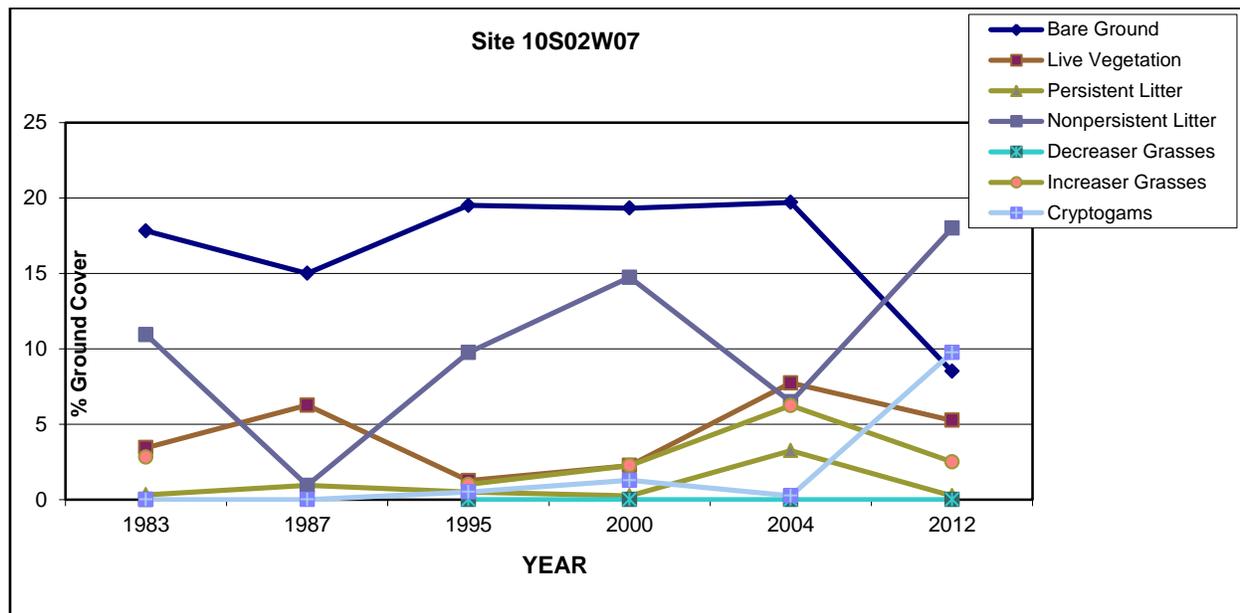


Figure 3. Basal Cover, Nested Plot Frequency Transects-SDR Pasture 7N, NPFT site 10S02W07

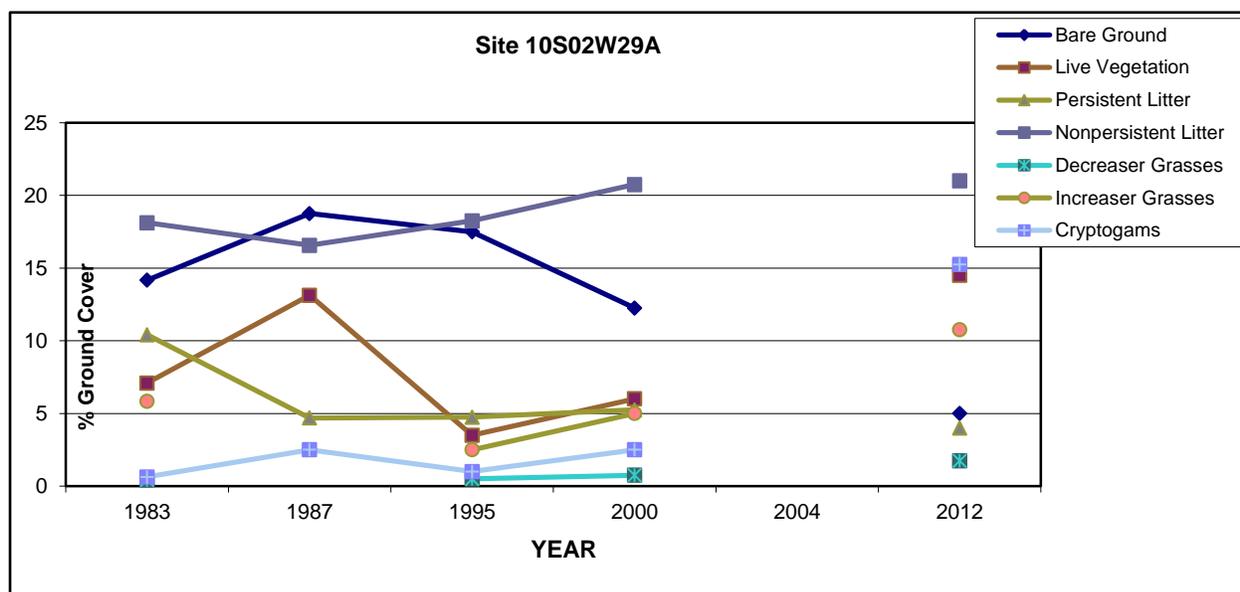


Figure 4. Basal Cover, Nested Plot Frequency Transects-SDR Pasture 7N, NPFT site 10S02W29A

***Rangeland Trend***

Trend data indicated a fluctuating but generally static trend in live vegetation basal cover at both during 1983 through 2012. Both reached their lowest values in 1995 and in 2000, after periods of below-normal crop year precipitation during 1987 through 1994 and again in 1999 and 2000. At 10S02W29A, live vegetation reached its highest values in 1987 and 2012 after periods of above-normal crop year precipitation. Non-persistent litter was static at both but showed fluctuation at site 10S02W07, which had the lowest vegetative basal cover. Bare ground was lowest and biological soil crusts were highest at both in 2012, reflecting in part favorable growth conditions during recent years, and there was no statistical relationship between bare ground and non-persistent litter cover at either. Basal cover of increaser grasses increased at site 10S02W29A with no change in decreaser grasses. Basal cover of increaser grasses were static overall at site 10S02W07, and decreaser grasses were not encountered.

**Pasture 7 (Late Spring/Early Summer Use)*****Rangeland Health Evaluation***

A total of 3 RHEs were completed in Pasture 7 between July 4 and September 4, 2004. Claypan ecological sites predominate but Churning Clay and Loamy ecological sites are also represented. Some Claypan stands have stony to extremely stony surfaces which protect them from disturbance. The Churning Clay stand is located in a small drainage collection area on top of Little Point. The Loamy stand is on the escarpment of that tableland.

The 2004 data indicated an overall slight to moderate departure as a whole for the site stability and watershed function-related Indicators within Pasture 7 (Table 3). The Churning Clay and Loamy RHEs exhibited slightly more departure from reference condition.

The Churning Clay evaluation area was reevaluated in 2012 and given a moderate departure rating. However, hummocking is a part of the natural site processes because of the monmorillonitic clay soils which is relevant to the minority of pedestalled plants that were observed. Nevada bluegrass is also still dominant, as found in 2004. Pasture 7N has been grazed primarily in June and July since 1987, although timing may be adjusted depending on availability of stored water in reservoirs. Grazing use generally occurs after the critical growth period for perennial grasses.

**Table 3. Summary of upland data collected in Pasture 7, Sierra Del Rio Use Area, Big Springs Allotment, 2004 with 2012 reevaluation.**

| Ecological Site     | Location | RHE Condition <sup>1</sup> Watershed | RHE Comments   |
|---------------------|----------|--------------------------------------|--|
| Churning Clay 12-16 | 11S03W13 | N-S (2004)                           | Hoof shearing common on grasses. Abundant stones and vegetation cover.   |
|                     |          | M (2014)                             | Many rocks and plants are pedestalled, exposed plant roots are common, bare areas of moderate size and sporadically connected, stabilizing agents present only in isolated patches, soil loss or degradation severe throughout site, infiltration is moderately reduced due to negative changes in plant community |
| Loamy 11-13         | 11S03W12 | S-M to N-S                           | Trailing and hoof shearing in shrub interspaces  |

| Ecological Site  | Location | RHE Condition <sup>1</sup><br>Watershed | RHE Comments                 |
|--|----------|---|------------------------------|
|  |          |   | is increasing bare ground.   |
| Shallow Claypan 12-16  | 11S03W02 | S-M                                     | Pedestals common and active. |
| <sup>1</sup> N-S = none-slight departure from reference conditions, S-M = slight-moderate departure from reference conditions, M = moderate departure from reference conditions, M-E = moderate-extreme departure from reference conditions. |          |   |                              |

The dominant indicators of **soil erosion** processes were again flow patterns and pedestalled plants (Indicators 2 & 3), indicating if present that soil loss and degradation has occurred. These are mostly historic processes on these evaluation areas except on the Claypan stand where slight active pedestalling was observed on increaser grasses. Based on surface flow patterns, minimal evidence of current soil deposition or erosion was present on the Churning Clay stand in 2004. Most other indicators showed at most slight to moderate departure from reference condition, except the amount of bare ground on the Loamy inclusion, which was influenced by the amount of grazing (reported as heavily grazed) observed. Utilization was much lower in 2012 than in 2004.

Soil factors affecting **hydrologic function** are adequate if there is good soil structure and sufficient organic matter in surface horizons and desirable shrub, forb, and bunchgrass species occupy the surface; particularly if decreaser bunchgrass species are common in shrub interspaces. The plant community indicator (10) showed at most slight to moderate departure from reference condition in 2004, with minor imbalance between decreaser and increaser bunchgrasses in evaluation areas, but current plant vigor and reproductive capability appeared lower than expected. Standing biomass of bunchgrasses was much higher at the time of the 2012 reevaluations than in 2004.

## Pasture 7S (Mid-Spring Use)

### *Rangeland Health Evaluation*

A total of 7 RHEs were completed in Pasture 7S between July 4 and September 4, 2004. Claypan ecological sites predominate, but are replaced by Stony Clayey ecological sites on the slopes of Big Springs Butte in the northeast portion. Stony Clayey and some Claypan stands have stony to extremely stony surfaces which protect them from disturbance. Loamy inclusions support big sagebrush communities, and are most prominent on tableland escarpments around the Indian Crossing base property, on mounds of deeper soil within Claypan stands, and on canyon slopes of Big Point.

The 2004 data indicated slight to moderate departure as a whole for site stability and watershed function-related Indicators within Pasture 7S (Table 4). The Loamy and one of two low mound Claypan (12S02W05) evaluation areas exhibited more departure from reference condition than others. Some RHEs (particularly 12S03W12A) were close to reference condition. Pasture 7S has been grazed primarily in May and June since 1987, although timing may be adjusted depending on availability of stored water in reservoirs. Grazing use generally occurs during the critical growth period for perennial grasses, although the permittee made an effort to defer portions of the pasture in 2012.

The Loamy evaluation area was reevaluated in 2012 and showed slight to moderate departure from reference condition. While not formally reevaluated, the low mound inclusions between Blue Creek Reservoir and the Indian Crossing base property showed lower composition of decreaser grasses and more evidence of current use in 2012, consistent with the pattern observed in 2000, 2005 and 2006.

**Table 4. Summary of upland data collected in Pasture 7S, Sierra Del Rio Use Area, Big Springs Allotment, 2004 with 2012 reevaluation.**

| Ecological Site  | Location  | RHE Condition <sup>1</sup><br>Watershed | RHE Comments  |
|--|-----------|---|---|
| Loamy 11-13  | 12S03W12B | M to S-M (2004)                         | Active erosion from flow patterns, little litter present, physical crust  |
|  |           | S-M (2014)                              | Minimal evidence of current soil deposition or erosion, pedestals common, less litter and interspace vegetation relative to site potential. |
| Stony Clayey 12-16   | 11S02W29  | S-M                                     | Where soils not protected by stones there are erosional features such as pedestals.   |
| Shallow Claypan 12-16  | 11S02W19  | S-M                                     | Sheared mounds of perennial grasses, active and historic pedestals, bare ground without expected interspatial vegetation.                   |
| Shallow Claypan 12-16  | 12S02W05  | M                                       | More bare ground than expected, soil loss evidenced by pedestals and cut areas, surface sealing.  |
| Shallow Claypan 12-16  | 12S02W18  | S-M                                     | Bare areas higher than expected, pedestals mostly historic, cut areas present but not common.   |
| Shallow Claypan 12-16  | 12S02W30  | N-S                                     | Virtually no bare ground due to abundant rock cover, no pedestals.  |
| Shallow Claypan 11-13  | 12S03W12A | N-S                                     | Soil surface covered extensively with rock and stones.  |
| <sup>1</sup> N-S = none-slight departure from reference conditions, S-M = slight-moderate departure from reference conditions, M = moderate departure from reference conditions, M-E = moderate-extreme departure from reference conditions. |           |   |   |

The dominant indicators of **soil erosion** processes were flow patterns and pedestalled plants (Indicators 2 & 3), indicating if present that soil loss and degradation has occurred in shrub interspaces. Erosion processes are historic except for the two evaluation areas with greater departure from reference, where minor active erosion from surface flow patterns or slightly active pedestalling were observed in 2004. In 2012, pedestalled increaser grasses were common on the Loamy reevaluation area, as they often are, but active pedestalling was rare. Only localized evidence of minor erosion occurred, if any, and active pedestalling was rare at the other evaluation areas.

Most other indicators showed at most slight to moderate departure from reference condition. The amount of bare ground showed moderate departure from reference condition at the same two evaluation areas, while the others had adequate amounts of litter to provide surface protection. In 2004, evaluation areas in Cowboy Basin, Bull Gulch, and on Big Point showed moderate to heavy utilization. In 2012, step-point cover at the Loamy reevaluation revealed only 16% bare ground, and utilization was none to slight on the predominant increaser grasses.

Soil factors affecting **hydrologic function** are adequate if there is good soil structure and sufficient organic matter in surface horizons and desirable shrub, forb, and bunchgrass species occupy the surface, particularly if decreaser bunchgrass species are common in shrub interspaces. Changes in hydrologic function at most were minor, but adverse changes in interspatial bunchgrass distribution and in balance between decreaser and increaser bunchgrasses were observed at the same two evaluation areas (12S03W12B, 12S02W05) in 2004. In 2012, increaser grasses were still the predominant species at the Loamy evaluation area, but the changes in plant cover have only a minor effect on infiltration.

**Rangeland Trend**

Frequency and basal cover data were collected at a single long-term trend site (12S02W18) between 1983 and 2012, also representing fine-soiled Claypan stands on low mounds and co-located with another RHE on Big Point. This study site has the lowest stone and gravel cover of any Claypan stand within the three Use Areas, and potentially the highest amount of bare ground.

The trend data indicated a fluctuating but generally declining trend in bare ground and generally static trend in non-persistent litter from 1983 through 2012 (Figure 5). Live vegetation basal cover and the basal cover of decreaser grasses and of increaser grasses, the major components of live vegetation cover, increased during 1983 through 2012. Persistent litter was static, while biological soil crusts increased markedly. Growth conditions in several previous years were good, but lack of snowpack and spring and summer precipitation in 2012 strongly reduced regrowth after grazing in that year.

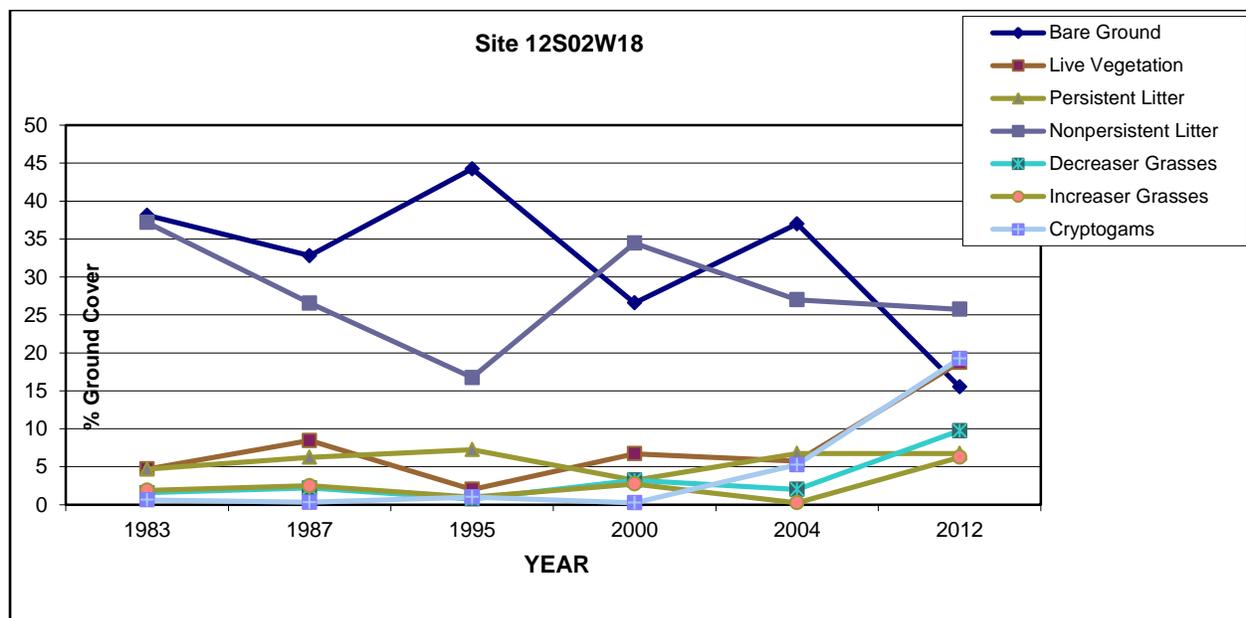


Figure 5. Basal Cover, Nested Plot Frequency Transects-SDR Pasture 7S, NPFT site 12S02W18

**Standards 2, 3, 7 Overview of Riparian Health Evaluations, Trend and Water Quality**

**Use Area Summary**

There was no variance in stream functioning condition ratings between Standards 2 and 3 on any discretely stratified stream segment in the Sierra Del Rio (SDR) use area; therefore, Table 5 provides a convenient summary of stream functioning condition for both Standards 2 and 3 for all stream segments. Components of standards 2 (e.g., vegetation that provides stream shading) and 3 (e.g.,

streambank stability) directly affect water quality (e.g., water temperature, sedimentation); therefore, standards 2, 3, and 7(Water Quality) are shown together in table 5. Functioning condition ratings of stratified stream segments, by pasture, are discussed in the *Stream Inventories/Assessments* subsections. Water quality assessments for each stream are discussed in the *Water Quality* section.

**Table 5. Combined summary table of stream functioning condition ratings (all stream segments) for Standards 2 and 3, and water quality for Standard 7 in the SDR use area. Big Springs Allotment (2003-2012 data).**

| Pasture 7N and 7NC (Summer Use)  |                          |                                      |             |               |             |                                     |
|--|--------------------------|--------------------------------------|-------------|---------------|-------------|-------------------------------------|
| Stream Name  | Flow Regime <sup>1</sup> | Functioning Condition Rating (miles) |             |               | Total       | H2O Quality Standards met? (yes/no) |
|  |                          | PFC                                  | FAR         | NF            |             |                                     |
| Deep   | P                        | 3.2                                  | 3.2 (2.3↑)  |               | 6.4         | no                                  |
| Camel <sup>2</sup>   | I                        | 0.8                                  | 3.4         |               | 4.2         | no                                  |
| Camel Falls  | I                        | 0.9                                  |             |               | 0.9         | no data                             |
| <b>Total miles (in pasture 7N &amp; 7NC)</b>   |                          | <b>4.9</b>                           | <b>6.6</b>  |               | <b>11.5</b> |                                     |
| Pasture 7 and 7S (Late Spring/Early Summer Use)  |                          |                                      |             |               |             |                                     |
| Stream Name  | Flow Regime <sup>1</sup> | Functioning Condition Rating (miles) |             |               | Total       | H2O Quality Standards met? (yes/no) |
|  |                          | PFC                                  | FAR         | NF            |             |                                     |
| Deep   | P                        | 14.1                                 | 2.2         |               | 16.3        | no                                  |
| Pole   | P/I                      | 8.5                                  | 1.1         |               | 9.6         | no                                  |
| Camel <sup>2</sup>   | P/I                      |                                      |             | 0.1           | 0.1         | yes                                 |
| Nickel   | P                        |                                      | 2.3         |               | 2.3         | no                                  |
| <b>Total miles (in pasture 7 &amp; 7S)</b>   |                          | <b>22.6</b>                          | <b>5.6</b>  | <b>0.1</b>    | <b>28.3</b> |                                     |
| <b>Grand Total (in use area)</b>   |                          | <b>27.5</b>                          | <b>12.2</b> | <b>0.1</b>    | <b>39.8</b> |                                     |
| <b>Percent by functioning condition</b>  |                          | <b>69%</b>                           | <b>30%</b>  | <b>&lt;1%</b> | <b>100%</b> |                                     |
| <sup>1</sup> P = perennial flow regime, I = intermittent flow regime<br>PFC (proper functioning condition), FAR (functioning-at-risk), NF- nonfunctioning<br>PFC ratings were determined from examination of both riparian and channel/floodplain indicators (BLM TR 1737-16, 1999).<br><sup>2</sup> Includes water-gaps in pastures 7 and 7NC<br>↑ = upward trend |                          |                                      |             |               |             |                                     |

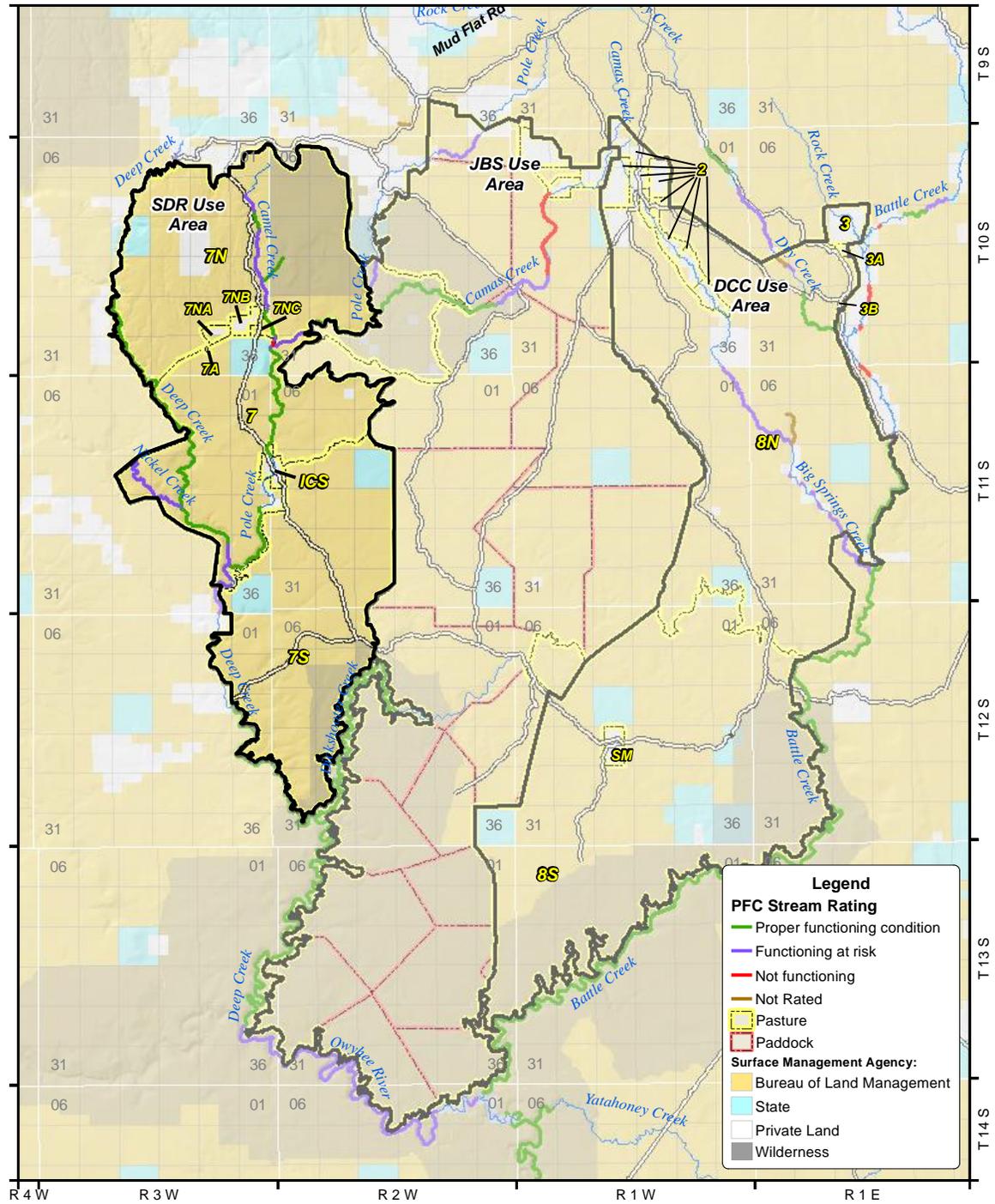
**Standard 2: Riparian Areas and Wetlands**

The locations of the individual streams are shown in Figure 6. The spring locations are shown in Figure 7.

**Pastures 7N and 7NC (Summer Use)****Streams**

Slightly more than one-half of streams in these pastures (7N & 7NC) were rated as functioning at risk (FAR). Bank-stabilizing species (e.g., willows, sedges, and rushes) do not dominate riparian plant communities on those segments. Consequently, streambanks are inadequately vegetated with deep-rooted plant species to resist the erosive forces of high stream flows, and they are at risk of further degradation.

Of the 12 wetland areas located at springs on public land in Pasture 7N, three were developed to provide water for livestock by piping water to troughs, but the wetland areas were not fenced to exclude livestock. These springs are FAR due to impacts of historic spring development (dewatering of wetlands), poor vigor of wetland vegetation, and mechanical disturbance to wetland soils. Six of the nine undeveloped springs are in proper functioning condition (PFC). Three undeveloped springs are FAR due to the low density and vigor of wetland-riparian vegetation, and mechanical disturbance to wetland soils.

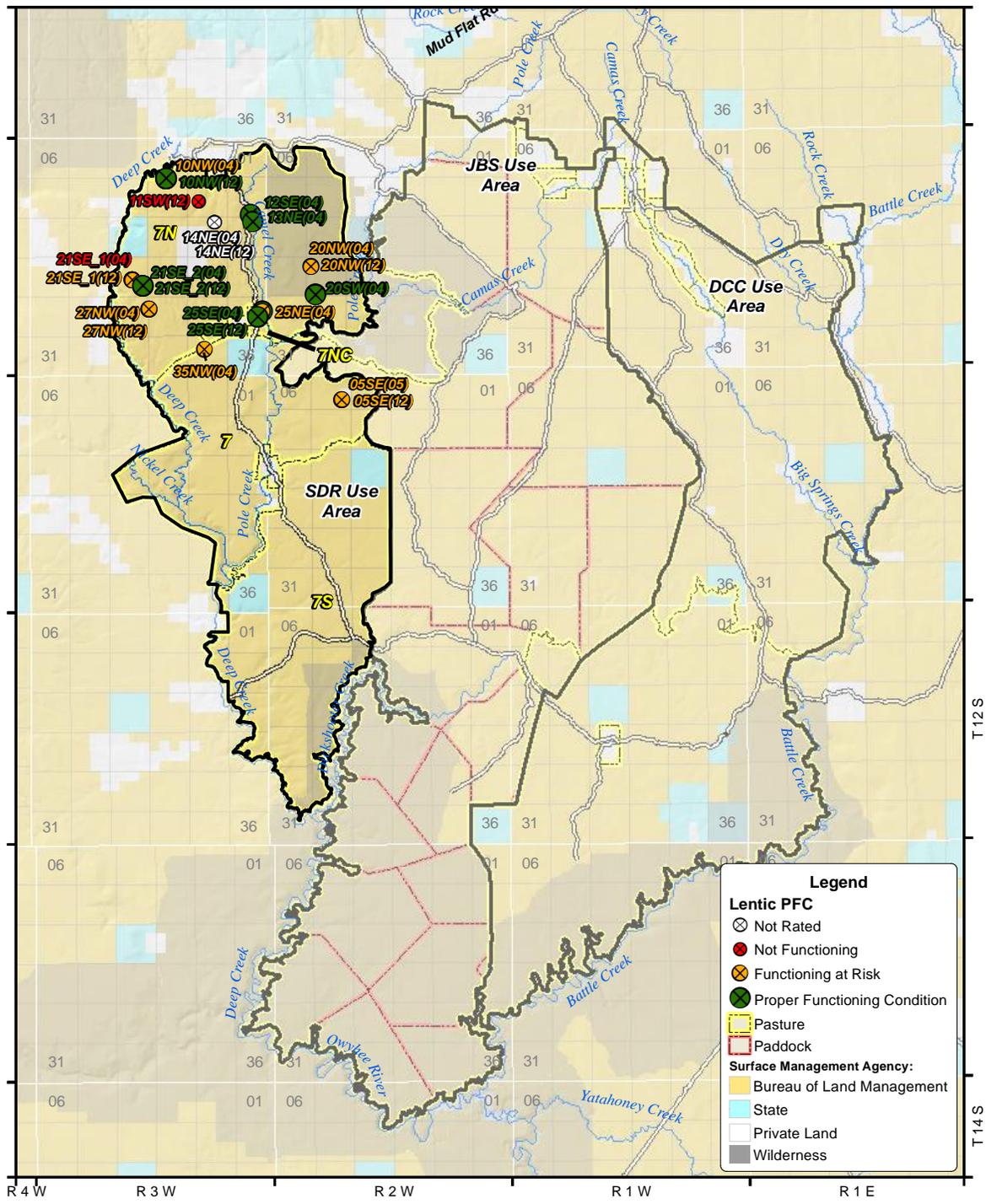


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Figure 6. Functioning Condition for Streams in the SDR Use Area



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Figure 7. Functioning Condition for Lentic Wetlands in the SDR Use Area.

### ***Stream Inventories/Assessments***

#### Deep Creek

Deep Creek and adjacent canyon rims form the western boundary of Pasture 7N. Riparian areas of Deep Creek are generally vegetated with plant communities dominated by willows (e.g., yellow willow, Pacific willow, and coyote willow). Most willow communities also have significant amounts of red-twig dogwood present. Riparian areas of Deep Creek in Pasture 7N that are located in canyon segments with significant amounts of rock in the floodplain are in PFC.

**Table 6. Riparian areas and riparian-wetland indicators and overall functioning condition rating by stream segment, Pasture 7N, Sierra Del Rio Use Area, Big Springs Allotment, 2005-2006.**

| Stream Segment   | Deep 29.0 | Deep 32.5 | Deep 36.9 |
|--|-----------|-----------|-----------|
| Functioning condition  | PFC       | FAR       | FAR↑      |
| Stream miles   | 3.2       | 0.9       | 2.3       |
| PFC (proper functioning condition), FAR (functioning at risk), NF- nonfunctioning (overall rating determined from examination of both riparian and channel/floodplain indicators).<br>↑ = upward trend |           |           |           |

Segments of Deep Creek that have floodplains composed primarily of gravels or fine sediments are FAR. A fence and rimrock prevents livestock from the Big Springs allotment from accessing Deep 29.0, and that segment is in PFC due to healthier, denser, vegetation. The other Deep Creek segments are accessible to livestock. High levels of sediment being delivered from degraded upstream channels located on other ownerships within the Owyhee Field Office boundary are affecting the development of stable channels and consequently development of riparian plant communities. The excessive sediment results in scouring of riparian areas and formation of new bars during high flows. However, this segment is in a moderate upward trend for Standard 2 as willows are regenerating, and sedges/rushes are increasing on suitable sites.

Additionally, streambanks of segments are not adequately vegetated with deep-rooted bank stabilizing species. Substantial areas are vegetated with grazing disturbance-induced spikerush, redtop, and Kentucky bluegrass and willow cover below potential densities. Consequently, some streambanks are inadequately vegetated to resist the erosive forces of high stream flows, particularly with high sediment loads.

#### Camel Creek

Camel Creek is a tributary to Pole Creek in the central portion of Pasture 7N and Pasture 7NC. Similarly, Camel 0.1 serves as a water gap for pasture 7NC. Stream flows are intermittent to perennial, with perennial surface water or nominal flows in downstream segments, and in a spring-influenced reach near the headwaters.

Approximately 0.1 mile of segment 0.0 of Camel Creek is located below Pasture 7NC and is in non-functioning (NF) condition. This segment is used as a water gap for Pasture 7N at Hawes Pasture. Streamside vegetation lacks bank-stabilizing species, particularly willows. Vigor of shrub and herbaceous riparian vegetation is low.

Camel Creek Segment 0.2 is located in a confined, rocky canyon and is in PFC. Riparian vegetation is dominated by willows, primarily yellow willow. Immediately upstream of the canyon, Segment 0.8 is also

in PFC, with streambanks well-vegetated with sedges and about 40% willow cover. These segments lie within Pasture 7NC.

**Table 7. Riparian areas and riparian-wetland indicators and overall functioning condition rating by stream segment, Pastures 7N and 7NC, Sierra Del Rio Use Area, Big Springs Allotment, 2012.**

| Riparian/Wetland Indicators:  | BLM Stream Segment |           |           |           |           |           |           |           |
|-------------------------------|--------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|                               | Camel 0.1          | Camel 0.2 | Camel 0.8 | Camel 1.0 | Camel 1.4 | Camel 1.5 | Camel 3.3 | Camel 3.9 |
| Overall functioning condition | FAR                | PFC       | PFC       | FAR       | FAR       | FAR       | FAR       | FAR       |
| Stream miles                  | 0.1                | 0.6       | 0.2       | 0.3       | 0.5       | 1.5       | 0.5       | 0.5       |

(PFC (proper functioning condition), FAR (functioning at risk), NF- nonfunctioning (overall rating determined from examination of both riparian and channel/floodplain indicators).

Upstream of segment 0.8, Camel Creek is located in wide valley bottom with easily accessible floodplains within Pasture 7N. Camel Creek is generally FAR from Segment 1.0 to the headwaters of the stream (Table 7). Most floodplains and streambanks are inadequately vegetated with bank-stabilizing species to maintain stable banks and stream channels. Willow cover is often reduced relative to site potential. Several segments are moisture limited because of the intermittent stream flow regime.

Two segments of Camel Creek are influenced by intermittent spring flows: segments 0.8 and 3.3. Segment 0.8 is weakly vegetated with bank-stabilizing species with low vigor. The spring wetland located at the downstream end of Segment 0.8 is rated as FAR because of excessive mechanical disturbance to wetland soils. Most of Segment 3.3 of Camel Creek has perennial surface flows and is well-vegetated with bank-stabilizing riparian vegetation dominated by Nebraska sedge and Baltic rush with scattered willows also present. The vegetation of this reach is healthy, but this reach is at risk of degradation because two large headcuts are present. The stream headwaters (Segment 3.9) have surface flows only during snowmelt runoff and have a discontinuous distribution of wetland plant communities (primarily Baltic rush). This stream segment is FAR because of an active headcut at the lower end of the segment.

Camel Falls Creek

Camel Falls Creek (0.9-stream-miles) is an intermittent flow regime tributary to Camel Creek. This stream was rated in PFC. Riparian plant communities alternate between those dominated by silver sage and grasses and communities dominated by Baltic rush, with varying amounts of willow and Nebraska sedge present. The uppermost 0.2 mile of this stream below Camel Falls has perennial stream flows, and is vegetated with a healthy yellow willow/rush species plant community.

**Riparian Utilization**

Utilization of riparian vegetation by livestock was high on accessible segments of streams located in Pasture 7N (Table 8).

**Table 8. Median stubble height and percent shrub utilization by livestock for streams in Pastures 7N and 7NC, SDR Use Area, Big Springs Allotment.**

| Stream Segment | Site         | Date     | Median Stubble Height (inches) | Percent Shrub Utilization |
|----------------|--------------|----------|--------------------------------|---------------------------|
| Deep (36.9)    | 10S03W3 NWSE | 10/16/01 | 2.0                            |                           |
| Deep (36.9)    | 10S03W3 NWSE | 10/16/02 | 2.5                            | 45                        |

| Stream Segment                             | Site         | Date     | Median Stubble Height (inches) | Percent Shrub Utilization |
|--|--------------|----------|--------------------------------|---------------------------|
| Camel (0.2)                                | 10S02W31NWNW | 10/28/99 | 2.5 <sup>a</sup>               | 25-50                     |
| <sup>a</sup> Ocular estimate (USBLM 1999). |              |          |                                |                           |

## Springs

Twelve springs are located in Pasture 7N, all of which support areas of riparian/wetland vegetation (Table 9). Three springs have been developed to provide water for livestock. The spring origin and the spring collection boxes were not fenced, and do not exclude the wetland areas from livestock use. Six of the undeveloped springs were in PFC (Table 9). Three of the undeveloped springs are FAR.

**Table 9. Condition of wetland-riparian areas at springs located in Pasture 7N, SDR Use Area, Big Springs Allotment, 2004-2012.**

| Spring Name    | Location            | Functioning Condition | Wetland-Riparian Vegetation/Impacts to Wetland  |
|----------------|---------------------|-----------------------|---|
| Hillside       | 10S03W Sec. 10 NENW | <sup>b</sup> PFC      | Diverse group of willows/ sedges/rushes/forbs; No signs of disturbance in 2012.   |
| Bat            | 11S03W11 NWSW       | NF                    | sedges/rushes/forbs in trough runoff area only; <i>developed spring</i> with wetland vegetation only at the trough runoff (rating applies to spring area above trough); All water from original spring source is piped to trough and the spring source is now nonfunctional.  |
| Cougar         | 10S03W14 NWNE       | Not rated.            | <i>Developed spring</i> with most wetland vegetation growing in runoff area from the troughs; Spring source has not been rated but has been documented as drying because of the diversion to the trough. extensive bare ground from livestock trampling and trailing;   |
| Little Jackass | 10S03W21 NWSE       | <sup>b</sup> FAR      | Aspen/sedges/rushes/forbs; <i>developed spring</i> ; early seral soft stemmed forbs dominant and not adequate to withstand erosive forces; wetland area is not fenced to exclude use; very small amount of wetland vegetation is growing in runoff area from the trough; extensive bare ground from trampling and trailing; |
| Jackass        | 10S03W 21 NESE      | <sup>b</sup> PFC      | aspen/sedges/rushes/grasses with high vigor; wetland was likely larger in past; hoof action at lower portion causing spring to dry.   |
| Moonshine      | 10S02W20 NWNW       | <sup>b</sup> FAR      | willow/rushes/sedges/grasses; pugging, trampling of wetland soils; erosion along bank beginning to channelize the spring.   |
| A              | 10S3W12             | <sup>a</sup> PFC      | Low mechanical damage and riparian stabilizing plants are present in high amounts.  |
| B              | 10S3W13             | <sup>a</sup> PFC      | Solid vigorous line of sedges along edges. Heavy utilization a concern for future.  |

| Spring Name   | Location         | Functioning Condition | Wetland-Riparian Vegetation/Impacts to Wetland   |
|---|------------------|-----------------------|--|
| G   | 10S02W20<br>SESW | <sup>a</sup> PFC      | <i>Ribes</i> /sedges/rushes; low utilization of riparian vegetation on 8/10/04; low levels of pugging and soil alteration  |
| C   | 10S03W27<br>SWNW | <sup>b</sup> FAR      | willows/rushes/sedges/grasses; Diverse and healthy sedge/rush community. Headcut near single willow at top of spring.  |
| E   | 10S03W25<br>NESE | <sup>b</sup> PFC      | willows/sedges/rushes; Plants are in good health. Moderate hoof action and road through wetland.   |
| F (mid-to lower Camel Cr.)  | 10S03W25<br>SENE | <sup>a</sup> FAR      | willows/sedges/rushes; >75% utilization of riparian vegetation on 8/10/04; flows channelized due to mechanical disturbance of wetland; excessive sediment deposition |
| <p>PFC (proper functioning condition), FAR (functional-at-risk), NF (nonfunctioning condition) Ratings were determined from examination of both riparian and channel/floodplain indicators (TR-1737-16 1999).</p> <p><sup>a</sup>Data collected in 2005</p> <p><sup>b</sup>Data collected in 2012</p> |                  |                       |  |

## Pastures 7 (Late Spring/Early Summer Use) and 7S (Mid-Spring Use)

### Streams

The majority of the streams in Pastures 7 and 7S are in rugged, rocky canyons that restrict livestock access. These segments are in PFC.

Of the five riparian-wetland areas located at springs on public land in Pastures 7 and 7S, the springs were not fenced to exclude livestock use at the spring heads. Three springs in Pasture 7 are FAR due to large amounts of bare soil, low density and vigor of wetland vegetation, and pugging/shearing of wetland soils. The presence of bare ground places these wetlands at risk for downcutting and soil loss. The other two springs were not recently assessed for functioning condition.

### *Stream Inventories/Assessments*

#### Deep Creek

Deep Creek and adjacent canyon rims form the western boundary of Pastures 7, with the exception of the area adjacent to the Nickel Creek confluence within Pasture 7. Riparian areas are generally vegetated with plant communities dominated by willows (yellow and coyote willows).

Riparian areas of Deep Creek in Pastures 7S and 7 that are located in canyon segments with significant amounts of rock in the floodplain are in PFC. Riparian areas of Deep Creek in Pasture 7S that have floodplains composed primarily of gravels or fine soils are PFC (Table 10). Willow cover is slowly increasing, but is slowed by scouring and channel adjustment of excessive sediment levels.

**Table 10. Riparian areas and riparian-wetland indicators and overall functioning condition rating by stream segment, Deep Creek, Pastures 7S and 7, SDR Use Area, Big Springs Allotment, 2003-2012.**

| Riparian/Wetland Indicators:  | Deep 11.6        | Deep 18.2        | Deep 21          | Deep 22.1        | Deep 23.3        | Deep 24.4        |
|---|------------------|------------------|------------------|------------------|------------------|------------------|
| Functioning condition   | <sup>a</sup> PFC | <sup>b</sup> PFC | <sup>c</sup> FAR | <sup>c</sup> FAR | <sup>c</sup> PFC | <sup>c</sup> PFC |
| Stream miles  | 5.8              | 1.8              | 1.2              | 1.0              | 1.7              | 4.8              |
| PFC (proper functioning condition), FAR (functioning at risk), NF- nonfunctioning (overall rating determined from examination of both riparian and channel/floodplain indicators)<br>a = 2003<br>b = 2005<br>c = 2006 |                  |                  |                  |                  |                  |                  |

Segments of Deep Creek in Pasture 7 that have floodplains composed primarily of gravels or fine soils and that are accessible to livestock are FAR with a static trend, due to both poor riparian plant composition and vigor, and impacts from excessive sediment levels (Table 10). These segments of Deep Creek are adjacent to the confluences of Nickel, Pole, and Castle creeks. They are not dominated by bank-stabilizing species and willow cover is lacking. Consequently, the streambanks are inadequately vegetated to resist the erosive forces of high stream flows. Additionally, excessive sediment is contributing to scouring of riparian areas and erosion (lateral cutting) of weakly vegetated streambanks. Scouring and erosion resulting from excessive sediment delivery is the primary factor affecting the functioning condition of segment 21.

#### Pole Creek

Pole Creek is a tributary to Deep Creek. This stream has intermittent to perennial flows. The lower portions of Pole Creek in Pastures 7 and 7S are mostly located in rocky, constricted canyons that prevent most livestock access and are in PFC (Segment 0.0, Table 11). The middle segments of Pole Creek are accessible to livestock and receive annual hot-season grazing use. These segments are FAR with a static trend in condition or are properly functioning, but at the low range of that condition class. Streamside vegetation receives high utilization levels annually. Riparian areas lack bank-stabilizing species, particularly willows. In the areas most accessible to livestock, vigor of riparian herbaceous species is poor.

**Table 11. Riparian areas and riparian-wetland indicators and overall functioning condition rating by stream segment, Pastures 7 and 7S, SDR Use Area, Big Springs Allotment, 2003 - 2012.**

| Riparian/Wetland Indicators:   | Stream Segment   |                  |                  |                  |                 |                  |
|--|------------------|------------------|------------------|------------------|-----------------|------------------|
|  | Pole<br>0.0      | Pole<br>4.3      | Pole<br>7.8      | Pole<br>9.3      | Camel<br>0.0    | Nickel<br>0.0    |
| Functioning condition  | <sup>b</sup> PFC | <sup>a</sup> PFC | <sup>b</sup> FAR | <sup>b</sup> PFC | <sup>c</sup> NF | <sup>b</sup> FAR |
| Stream miles   | 2.1              | 3.6              | 1.1              | 2.7              | 0.1             | 2.3              |
| PFC (proper functioning condition), FAR (functioning at risk), NF- nonfunctioning (overall rating determined from examination of both riparian and channel/floodplain indicators).<br>a = 2003<br>b = 2006<br>c = 2012 |                  |                  |                  |                  |                 |                  |

### Camel Creek

Camel Creek was last monitored for functioning condition in 2012. Camel Creek is a tributary to Pole Creek. A 0.1-mile-long reach of Camel Creek (segment 0.0, Table 11) provides a “water-gap,” which is located in the northern portion of Pasture 7. This segment has perennial flows, and is NF condition. Streamside vegetation receives high utilization levels annually. Riparian areas lack bank-stabilizing species, particularly willows. Cover, density, and vigor of riparian herbaceous vegetation is very low. Soil compaction levels are very high.

### Nickel Creek

Nickel Creek (2.3-stream-miles), located in the west-central portion of Pasture 7 is a tributary to Deep Creek. Riparian vegetation along this stream receives very high utilization levels, as the reach is fully accessible to livestock for watering, grazing, and resting. Willow frequency is reduced well beyond potential densities or is missing entirely from several reaches where willows should occur. The vigor of herbaceous riparian vegetation is also very low, and is dominated by exotic Kentucky bluegrass. This segment is FAR with static trend. Streambanks are inadequately vegetated with bank stabilizing species; willow cover in particular is low relative to site potential. Soil compaction levels were very high.

### ***Riparian Utilization***

Utilization of riparian vegetation by livestock was generally high on accessible segments of Deep and Pole creeks in Pastures 7 and 7S (Table 12). Rugged canyon segments of Pole and Dickshooter creeks received little to no livestock use. Livestock use of young willows (<1.5 m in height) was also monitored on Pole Creek (Segment 7.8) on 3 August 2005. Incidence of leader use by livestock was high and averaged 77%.

**Table 12 Median stubble height of streams in Pastures 7 and 7S, SDR Use Area, Big Springs Allotment, 1996-2012.**

| Stream Segment | Site          | Date     | Median Stubble Height (inches) |
|----------------|---------------|----------|--------------------------------|
| Camel (0.0)    | 10S02W31 NWNW | 10/28/99 | 3-4 <sup>a</sup>               |
| Camel (0.0)    | 10S02W31 NWNW | 10/5/00  | 3.5-4 <sup>a</sup>             |
| Camel (0.0)    | 10S02W31 NWNW | 8/3/05   | 2 <sup>a</sup>                 |
| Deep (20.8)    | 11S03W35SWSW  | 10/8/99  | 2.0 <sup>a</sup>               |

| Stream Segment    | Site          | Date      | Median Stubble Height (inches) |
|-------------------|---------------|-----------|--------------------------------|
| Pole (4.3)        | 10S02W31 SWNW | 10/28/99  | 2-3 <sup>a</sup>               |
| Pole (4.3)        | 10S02W31 SWNW | 10/5/00   | 5 <sup>a</sup>                 |
| Pole (7.8)        | 10S02W31 NWNW | 10/5/00   | 2.5                            |
| Deep (16.8)       | 12S03W11 SWNE | Fall 1996 | 3.0                            |
| Deep (16.8)       | 12S03W11 SWNE | 9/30/99   | 8.0                            |
| Deep (16.8)       | 12S03W11 SWNE | 10/19/00  | 6 <sup>a</sup>                 |
| Dickshooter (0.0) | 12S02W29      | 9/27/99   | 18.0 <sup>a</sup>              |
| Pole (0.0)        | 11S03W26 NESE | 10/7/99   | 20-24 <sup>a</sup>             |

<sup>a</sup>Ocular estimate (USBLM 1999).

### ***Riparian Trend***

Photo monitoring showed a slow upward trend in health of riparian plant communities on Deep Creek (segments 15 and 16) in Pasture 7S from the late 1990's to 2005. Photos of Pole Creek in Pasture 7 (Segment 7.8) show a static trend in willow recruitment and cover. Similarly, photos show a static trend in the condition of lower Camel Creek in Pasture 7.

### **Springs**

Two undeveloped springs were rated in Pastures 7 and 7S (Table 12). Both springs were found in FAR condition. Wetland-riparian vegetation received high levels of utilization, and plant density and vigor were low. Additionally, wetland soils were mechanically disturbed by compaction, trampling and pugging.

**Table 12. Condition of wetland-riparian areas at springs located in Pastures 7 and 7S, SDR Use Area, Big Springs Allotment, 1995-2012.**

| Spring Name     | Location      | Functioning Condition | Wetland-Riparian Vegetation/Impacts to Wetland   |
|-----------------|---------------|-----------------------|--|
| Dry Lake Spring | 10S03W35 SENW | FAR <sup>b</sup>      | sedges/rushes/forbs; extensive trampling, pugging of wetland soils and flow alteration   |
| Antelope        | 11S02W05 SESE | FAR <sup>b</sup>      | willows/sedges/rushes/forbs/grasses; areas of hummocking, shearing, and pugging of wetland soils; only 1 decadent willow present |

PFC (proper functioning condition), FAR (functional-at-risk), NF (nonfunctioning condition) Ratings were determined from examination of both riparian and channel/floodplain indicators (TR-1737-16 1999).  
<sup>a</sup>Data collected in 2005  
<sup>b</sup>Data collected in 2012

**Standard 3: Stream Channel and Floodplain**

The locations of the stream segments are shown in Figure 6, with the labels at the downstream end of each segment.

**Pasture 7N and 7NC (Summer Use)**

**Streams**

Over half of the stream channels in Pastures 7N and 7NC are FAR and are not in balance with the landscape setting. Many channels are dependent on riparian vegetation for stability since they contain relatively small amounts of rock. Riparian plant communities lack the vegetative cover and bank-stabilizing species necessary to maintain stable channels and floodplains. Stream segments that are properly functioning are located in rocky canyons that greatly restrict livestock access and use of riparian plants so that the stream channel shape and form are in balance with the landscape setting.

***Stream Inventories/Assessments***

Deep Creek

Portions of Deep Creek were evaluated for functioning condition in 2012. Half of the stream channels of Deep Creek are FAR (Table 13). These segments are over-widened and shallow relative to the landscape setting, and unstable due to very high loads of sediment supplied by degraded reaches upstream of the SDR Use Area. These sediment levels contribute to scouring that limits the establishment of bank-stabilizing species.

Stream segments located in narrow floodplain areas with a significant amount of rock are moving the high load of sediment downstream without negative impacts to riparian and channel health (Segments 026 to 028).

**Table 13. Riparian areas and riparian-wetland indicators and overall functioning condition rating by stream segment, Pasture 7N, Sierra Del Rio Use Area, Big Springs Allotment, 2005-2006.**

| Stream Channel/Floodplain Indicators   | Stream segment |              |              |
|--|----------------|--------------|--------------|
|  | Deep<br>29.0   | Deep<br>32.5 | Deep<br>36.9 |
| Functioning condition  | PFC            | FAR          | FAR          |
| Stream miles   | 3.2            | 0.9          | 2.3          |
| PFC (proper functioning condition), FAR (functioning at risk), NF- nonfunctioning (overall rating determined from examination of both riparian and channel/floodplain indicators). |                |              |              |

Camel Creek

Camel Creek was last monitored for functioning condition in 2012. Camel Creek was last Segments 0.2 through 0.7 are located in Pasture 7NC. The middle portion of the stream (Segment 0.2) is located in a confined, rocky canyon and is in PFC. Above the canyon stream segments are located in wide floodplains. The floodplain and streambanks of Segment 0.8 are well vegetated, and are properly functioning, although large amounts of sediment are being delivered to this segment.

**Table 14. Stream channel/floodplain indicators and functioning condition rating by stream segment, Pastures 7NC and 7N, SDR Use Area, Big Springs Allotment, 2012.**

| Stream Channel/Floodplain Indicators   | BLM Stream Segment |           |           |           |           |           |           |           |
|--|--------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|  | Camel 0.1          | Camel 0.2 | Camel 0.8 | Camel 1.0 | Camel 1.4 | Camel 1.5 | Camel 3.3 | Camel 3.9 |
| Overall functioning condition  | FAR                | PFC       | PFC       | FAR       | FAR       | FAR       | FAR       | FAR       |
| Stream miles   | 0.1                | 0.2       | 0.2       | 0.3       | 0.5       | 1.5       | 0.5       | 0.5       |
| PFC (proper functioning condition), FAR (functioning at risk), NF- nonfunctioning (overall rating determined from examination of both riparian and channel/floodplain indicators). |                    |           |           |           |           |           |           |           |

The remaining segments of Camel Creek are located within Pasture 7N (Table 14). Segment 1.0 receives excessive sediment, the channel is over-widened and shallow, and streambanks are inadequately vegetated to maintain stable banks and stream channels. Additionally, the floodplain and channel inadequately dissipate the energy of stream flows, with considerable scouring present. The loss of soil moisture impacts the ability of this reach to grow obligate riparian vegetation. Likewise, Segment 1.5 has over-widened, unstable stream channels, is moisture-limited due to historical watershed impacts and cannot grow riparian vegetation needed to stabilize channels and floodplains.

Channels of Segment 1.4 are geologically controlled by areas of bedrock that have prevented the channel from incising. Fine soils are still present, channels are stable, and the reach is functioning properly. Segments 3.3 and 3.9 of Camel Creek are generally well-vegetated, with stable channels and floodplains, but are FAR because of the presence of one or more active headcuts on the stream channel.

Camel Falls Creek

Camel Falls Creek is tributary to Camel Creek, and flows are mostly intermittent (Table 15). The stream channels, banks, and floodplains are stable due to rock armoring. The uppermost 0.2 mile below Camel Falls has perennial flows of surface water and is generally well-vegetated by a yellow willow/sedge plant community. The channel shape of a portion of the uppermost 0.2 mile is wide and shallow, but further degradation is unlikely due to rock armoring of the floodplain.

**Pastures 7 (Late Spring/Early Summer Use) and 7S (Mid-Spring Use)**

Most stream channels (81%) of stream segments located in Pastures 7 and 7S were in PFC. Stream segments that are properly functioning are located in rocky canyons that greatly restrict livestock access to and use of riparian plants. Segments of Deep, Nickel, and Pole creeks that are FAR have inadequate vegetative cover and lack the dense deep-rooted plants necessary for maintenance of stable channels and floodplains. Those stream channels and floodplains are not currently in balance with the landscape setting. Much of Deep Creek is also negatively impacted by a high load of sediment that is being delivered from degraded stream channels upstream of the allotment and Use Area boundary.

***Stream Inventories/Assessments***

Deep Creek

Most of the reaches of Deep Creek are in PFC. About 2 miles of stream channels and floodplains of Deep Creek in Pastures 7 and 7S are FAR. They are over-widened and shallow, and are unstable due to very high loads of sediment supplied by degraded reaches upstream (Table 15). These sediment levels contribute to scouring that limits the establishment of bank-stabilizing species and also increases lateral cutting.

Stream segments located in narrow floodplain areas with a significant amount of rock are moving the high sediment load downstream without negative impacts to riparian and channel health (segments 11.6, 18.2, 22.6, and 24.4).

**Table 15. Stream channel/floodplain functioning condition rating by stream segment, Pastures 7S and 7, SDR Use Area, Big Springs Allotment, 2005-2006.**

| Stream Channel/Floodplain Indicators   | BLM Stream Segment |                  |                  |                  |                  |                  |
|--|--------------------|------------------|------------------|------------------|------------------|------------------|
|  | Deep 11.6          | Deep 18.2        | Deep 21.0        | Deep 22.1        | Deep 23.3        | Deep 24.4        |
| Functioning condition  | <sup>a</sup> PFC   | <sup>b</sup> PFC | <sup>c</sup> FAR | <sup>c</sup> FAR | <sup>c</sup> PFC | <sup>c</sup> PFC |
| Stream miles   | 5.8                | 1.8              | 1.2              | 1.0              | 1.7              | 4.8              |
| PFC (proper functioning condition), FAR (functioning at risk), NF- nonfunctioning (overall rating determined from examination of both riparian and channel/floodplain indicators). |                    |                  |                  |                  |                  |                  |

Pole Creek

All segments of Pole Creek were re-inventoried in 2012. The middle portions of Pole Creek in Pasture 7 (Segments 4.3, 7.8) are accessible to livestock, and most riparian areas are not widening nor achieving their potential extent (Table 16). The channel of Segment 7.8 is over-widened and shallow and is FAR. About 20% of the floodplain in Segment 4.3 is impacted by trampling and shearing that places those portions of the stream at risk to erosion during high flows, but overall the channel and floodplain was rated as in PFC.

**Table 16. Riparian areas and riparian-wetland indicators and overall functioning condition rating by stream segment, Pastures 7 and 7S, SDR Use Area, Big Springs Allotment, 2003 - 2012.**

| Riparian/Wetland Indicators   | Stream Segment   |                  |                  |                  |                 |                  |
|---|------------------|------------------|------------------|------------------|-----------------|------------------|
|   | Pole 0.0         | Pole 4.3         | Pole 7.8         | Pole 9.3         | Camel 0.0       | Nickel 0.0       |
| Functioning condition*  | <sup>b</sup> PFC | <sup>a</sup> PFC | <sup>b</sup> FAR | <sup>b</sup> PFC | <sup>c</sup> NF | <sup>b</sup> FAR |
| Stream miles  | 2.1              | 3.6              | 1.1              | 2.7              | 0.1             | 2.3              |
| *PFC (proper functioning condition), FAR (functioning at risk), NF- nonfunctioning (overall rating determined from examination of both riparian and channel/floodplain indicators).<br>a = 2003<br>b = 2006<br>c = 2012 |                  |                  |                  |                  |                 |                  |

The lower portion of Pole Creek (Segment 0.0) in Pastures 7 and 7S is in PFC, with stable channels. In this segment, Pole Creek forms a part of the common boundary, and is accessible from both pastures at the upper and lower ends of that segment.

Camel Creek

Approximately 0.1 mile of the Camel 0.0 segment (Table 16) is NF. This location furnishes a water gap for Pasture 7N at Hawes Pasture. The channel is wide and shallow, bank-stabilizing species are lacking, and sediment levels are elevated.

Nickel Creek

Nickel Creek (2.3-miles) in the Nickel Creek Pocket area of Pasture 7 is over-widened and shallow (high width/depth ratios). The plant community has a very low percentage of deep-rooted bank stabilizing species, particularly willows and sedges. This segment is in FAR condition with a static trend (Table 16).

**Standard 4: Native Plant Communities**

The assessment of native plant communities is based on: field evaluations of rangeland health, samples of key species frequency, shrub density, and ground cover samples, photograph monitoring, remote sensing, and aerial imagery. Photographs are discussed in the context of quantitative data, where applicable. Additional photographs are available in the project record.

The following sections are organized by pasture, starting in the south and moving northward. Under each pasture heading a rangeland health summary is given. The rangeland health indicators that directly relate to Standard 4 are then addressed separately. These include Plant Community Integrity, Plant Vigor, and Noxious and Invasive Weeds. Range Trend data is the last topic covered under each pasture heading.

**Pasture 7S (Mid-Spring Use)*****Rangeland Health Evaluation***

An ID team assessed range health at seven locations in this pasture in 2004 and revisited one of those in 2012. Fine-soiled areas generally exhibited greater departure from reference conditions than stonier sites, with some exceptions on Claypan sites. Idaho fescue and needlegrass plants often had low vigor and were under-represented as a group in these areas. Two RHEs on Big Point (12S03W12A and 12S02W30) were close to reference conditions and served as reference areas. The 2004 and 2012 data describe a slight to moderate departure for the native plant community indicators in pasture 7S (Table 17).

**Table 17. Summary of upland data collected in Pasture 7S, Sierra Del Rio Use Area, Big Springs Allotment, 2004.**

| Ecological Site       | Location               | RHE Condition <sup>1</sup><br>Biotic | RHE Comments   | NPFT Trend       |
|-----------------------|------------------------|--------------------------------------|--|------------------|
| Stony Clayey 12-16    | 11S02W29               | S-M                                  | reduced bunchgrass vigor and reproductive capability   | No Data          |
| Loamy 11-13           | 12S03W12B <sup>2</sup> | M to S-M                             | Heavy to severe current bunchgrass utilization, poor regrowth, dead crowns, reduced reproductive capability; shrub decadence. Bunchgrasses underrepresented, well below potential. | No Data          |
| Shallow Claypan 12-16 | 11S02W19               | S-M                                  | Heavy bunchgrass utilization, poor regrowth, reduced vigor, dead crowns, reduced reproductive capability; shrub decadence  | No Data          |
| Shallow Claypan 12-16 | 12S02W05               | S-M                                  | Heavy bunchgrass utilization, poor regrowth, reduced vigor, dead crowns, reduced reproductive capability; shrub decadence  | No Data          |
| Shallow Claypan 12-16 | 12S02W18               | S-M                                  | Historic pedestalling, reduced reproductive capability, good vigor and regrowth on FEID.   | Static to Upward |

| Ecological Site  | Location  | RHE Condition <sup>1</sup><br>Biotic | RHE Comments   | NPFT Trend |
|--|-----------|--------------------------------------|--|------------|
| Shallow Claypan 12-16  | 12S02W30  | N-S                                  | Plant community near potential. Livestock utilization appeared none to slight in 2004. | No Data    |
| Shallow Claypan 11-13  | 12S03W12A | N-S                                  | Plant community near potential. Appears to receive less use than loamy sites nearby    | No Data    |
| <sup>1</sup> N-S = none-slight departure from reference conditions, S-M = slight-moderate departure from reference conditions, M = moderate departure from reference conditions, M-E = moderate-extreme departure from reference conditions.<br><sup>2</sup> This location sampled in 2004 and 2012. |           |                                      |  |            |

### Plant Community Integrity

Plant community integrity and native species diversity indicators show a general slight to moderate departure on most fine-soiled, non-stony RHEs in this pasture, with a decrease in interspatial perennial bunchgrasses and a slight increase in relative dominance by increaser grasses. The Loamy RHE showed the greatest departure with a large reduction in decreaser grasses and an overall reduction in interspatial grasses. This condition represents the majority of the Loamy sites in this pasture. The re-sampling effort in 2012 found conditions similar to those documented by the 2004 evaluation.

The Shallow Claypan RHEs in the northern half of this pasture showed a slight to moderate departure from reference conditions. These Claypan sites are not as stony as others located in this pasture. At 11S02W19 and 12S02W05, decreaser bunchgrasses were well below potential for the site. At the Stony Clayey RHE 11S02W29, it was noted that the slight to moderate departure from reference conditions was mainly historic. Native plant community integrity on these sites improves to near reference condition further south. Low sagebrush communities bordering the Owyhee and Deep Creek canyons have a very stony surface texture and are near biotic potential, with all structural and functional groups present and in appropriate ranges.

Annual production in this pasture is within 80% of expected at four of the seven RHEs. Annual production at the Loamy (12S03W12B) and at two of the non-stony Shallow Claypan (11S02W19 and 12S02W05) RHEs is 60-80% of expected production, due to decreased perennial grass production, heavy to severe current utilization, and poor regrowth. Overall shrub productivity is similar to reference sites, except at two RHEs (Loamy, 12S03W12B; and Claypan, 12S02W05), where shrub cover is greater than expected. Leguminous species (lupine, clover, and milkvetch) were reported at four of the seven RHEs.

### Plant Vigor

Plant vigor was variable in this pasture. Plants were vigorous at the two Claypan RHEs to the south (12S02W30) and west (12S03W12A), where native plants exhibited diverse age classes, good vigor, and reproductive capability. Little if any livestock utilization was noted at either of these sites in 2004 and surface rock was abundant in both areas.

Plant vigor on the fine-soiled Shallow Claypan (11S02W19) and the Loamy sites (12S03W12B) with heavy to severe utilization showed a moderate departure from reference conditions in 2004. Common characteristics included: more active and historic pedestals than expected, crown die-out; shrub decadence; reduced reproductive capability of perennial grasses; and low plant vigor. Similarly, at RHE 12S02W05 it was noted that this RHE appears to be located in a high use area, both historically and currently. Utilization was heavy in 2004, with many plants eaten down to the basal area.

Plant vigor at the two Stony Clayey sites to the north was variable. The northern-most site (11S02W19), displayed reduced vigor on all interspatial perennial bunchgrasses and Idaho fescue appeared heavily grazed and weak. Dead, or partially dead grass crowns were common and the stand’s reproductive capability was moderately depressed overall. Sagebrush plants were also less vigorous at this site. Similar but slightly better conditions were noted at the other Stony Clayey site (11S02W29) 1.2 miles southeast.

Noxious and Invasive Weeds

Noxious weeds were not observed. Invasive plants were observed at three RHEs. Trace amounts of cheatgrass were reported at the two stony Shallow Claypan (12S02W30 and 12S03W12A) RHEs and at the Stony Clayey (11S02W29) RHE. Cheatgrass was scattered at the Loamy site (12S03S12B) in 2012, after the 2004 ID team identified none at the same location in 2004.

**Pasture 7 (Late-Spring/Early Summer Use)**

***Rangeland Health Evaluation***

An ID team sampled rangeland health attributes in pasture 7 at three locations in 2004 and revisited one of those locations in 2012 for re-sampling. Native plant communities were well established and functioning at all three of the sites, although some indicators of native plant community health were less than ideal in all cases. The loamy sites appear to receive substantially more use than the stonier claypan sites. All three RHEs exhibited approximately the same departure from reference conditions (Table 18).

**Table 18. Summary of upland data collected in Pasture 7, Sierra Del Rio Use Area, Big Springs Allotment, 2004.**

| Ecological Site   | Location  | RHE Condition <sup>1</sup><br>Biotic | RHE Comments   |
|---|-----------|--------------------------------------|--|
| Churning Clay 12-162  | 11S03W132 | S-M in 2004<br><br>M in 2012         | Some bunchgrass root exposure, dead crowns; decadence and reduced shrub vigor  |
| Loamy 11-13   | 11S03W12  | M to S-M                             | Decreased perennial grass production, severe current utilization, lack of regrowth, reduced vigor; decadence and reduced shrub vigor; scattered cheatgrass |
| Claypan 12-16   | 11S03W02  | S-M                                  | Some bunchgrass root exposure, dead crowns   |
| <sup>1</sup> N-S = none-slight departure from reference conditions, S-M = slight-moderate departure from reference conditions, M = moderate departure from reference conditions<br><sup>2</sup> This location sampled in 2004 and 2012. |           |                                      |  |

Shrub decadence was a common occurrence in 2004 and 2012. The 2004 RHE in the Churning Clay site (11S03W13) showed less departure from reference conditions than the same area in 2012. The Loamy RHE (11S03W12) represented big sagebrush inclusions that occur on tableland escarpments and was also within 0.4 miles of Indian Crossing Reservoir. Plant communities in loamy ecosites exhibited moderate—extreme in the cases big sagebrush—amounts of decadence and low vigor. Although no RHEs were conducted in Stony Clayey ecological sites, resource specialists estimated they are near reference condition in 2004. The Claypan RHE (11S03W02) represented the predominant low sagebrush communities. Surface stones and gravel were common at that location. Soil surface rock fragments are variable in the Claypan ecosites of this pasture.

### Plant Community Integrity

Plant community integrity and native species diversity indicators on the Claypan and Loamy RHEs show a slight to moderate departure from reference conditions, with a slight increase in the amount of increaser grasses in shrub interspaces. The Little Point area, is characterized primarily by Churning Clay ecological sites with Stony Clayey sites surrounding the edges of the table. At the Churning Clay site (11S03W13), all structural and functional groups were present but soil indicators suggest that the native plant community is adversely affected by soil-plant interactions. The 2012 assessment identified moderate to extreme levels of soil surface loss and degradation, soil compaction, and reduced soil surface resistance to erosion. Although no assessments were conducted in Stony Clayey ecological sites, resource specialists estimated that they are near reference condition in 2004.

Annual production is within 80% of expected production, except for the Loamy (11S03W12) RHE. At that location, annual production was reduced to 60-80% of expected, due to decreased perennial grass production, severe current utilization, and lack of regrowth. Big sagebrush exhibited moderate to extreme amounts of decadence. Sagebrush growth forms exhibited trampling effects in 2004 and 2012. Wood and manure provided a high proportion of soil surface litter. Leguminous species (lupine) were reported at two of the three RHEs.

### Plant Vigor

Plant vigor was slightly, to moderately depressed at all sample areas, with some variation between sites. At the Shallow Claypan and Churning Clay sites, low vigor and decadence was associated with pedestalled bunchgrasses between shrub canopies. Root exposure and crown mortality on bluegrass and Idaho fescue plants had influenced plant health and reproductive capabilities were reduced in those plants. Sagebrush, however, appeared vigorous at the Claypan site in 2004.

Sagebrush at the Loamy and Churning Clay sites displayed decadence and low vigor in 2004 and in 2012. Reduced seed head production and decreased vigor on grasses were observed at all three RHEs, but primarily reflected heavy current utilization at the Loamy RHE. Utilization of bluebunch wheatgrass at the Loamy site appeared heavy in 2004 and although still common throughout the site, displayed reduced vigor. This Loamy RHE site was stated to be characteristic of the Loamy inclusions.

Utilization studies in 2000, 2005 and 2006 showed many of the Claypan sites as having only slight use (Figure 1, page 46), while the Loamy RHE site exhibited light (2005) to heavy use (2000). When the RHEs were completed in 2004, utilization was severe at the Loamy RHE site based upon the photos. It was noted that current utilization 'appeared' moderate on the Churning Clay ecological site, with some evidence of damage by shearing.

### Noxious and Invasive Weeds

Noxious weeds were not observed. Overall, invasive plants show none to a slight departure from reference areas. Cheatgrass was scattered at the Loamy RHE site (11S03W12) in 2004. Cheatgrass and Japanese brome were scattered in small amounts at the Churning Clay site in 2012 (11S03W13).

### ***Rangeland Trend***

Long-term trend studies are not established in pasture 7.

### **Pasture 7N and 7NC (Summer Use)**

#### ***Rangeland Health Evaluation***

An ID team assessed rangeland health in pasture 7N at sixteen locations in 2004 and revisited two of those locations in 2012. The team sampled one site in pasture 7NC in 2012. Native plant communities in

the north end of Pasture 7N closely resembled reference conditions but invasive juniper, bulbous bluegrass, and cheatgrass were common associates. The stony clayey 12-16 site (10S02W07B) and loamy 13-16 site (10S03W03) were nearest to reference conditions and were used for comparison. Plant communities in the south end—near the Spencer Butte area—rated slightly lower than those in the north, due primarily to a general under-representation of Idaho fescue plants. Plants throughout the area displayed low vigor and even defoliation in 2012, likely due to a combination of low precipitation and aroga moth. With the exceptions of invasive species and low vigor, the native plant community indicators were similar to reference conditions (Table 19).

**Table 19. Summary of upland data collected in Pastures 7N & 7NC, Sierra Del Rio Use Area, Big Springs Allotment, 2004.**

| Ecological Site      | Location               | RHE Condition <sup>1</sup><br>Biotic | RHE Comments  | NPFT Trend         |
|----------------------|------------------------|--------------------------------------|---|--------------------|
| Shallow Breaks 14-18 | 10S03W12B              | N-S                                  | Good distribution of perennial grasses in interspaces.  |                    |
| Churning Clay 12-16  | 10S02W07C              | N-S                                  | Some shift in expected grass species and presence of bulbous bluegrass.                             |                    |
| Stony Clayey 12-16   | 10S02W07B              | N-S                                  | Near reference condition.   |                    |
| Stony Clayey 12-16   | 10S02W18               | N-S                                  | Site is well protected biotically.  |                    |
| Stony Clayey 12-16   | 10S02W07               | No Data                              |   | Static to Downward |
| Clayey 12-15         | 10S02W07A              | N-S                                  | All vegetation groups present in appropriate amounts.   |                    |
| Loamy 13-16          | 10S03W12A <sup>2</sup> | S-M                                  | Dead crowns, reduced bunchgrass vigor   |                    |
| Loamy 13-16          | 10S03W03               | N-S                                  | Biotically near potential.  |                    |
| Loamy 13-16          | 10S03W26               | S-M                                  | More rabbitbrush, bluegrass dominant, cheatgrass common   |                    |
| Claypan 12-16        | 10S03W24 <sup>2</sup>  | S-M                                  | Bulbous bluegrass common  |                    |
| Claypan 12-16        | 10S03W12               | S-M                                  | Bulbous bluegrass common  |                    |
| Claypan 12-16        | 10S02W29A              | S-M                                  | Decadent shrubs, reduced vigor  | Upward             |
| Claypan 12-16        | 10S02W29B              | S-M                                  | Decadent shrubs, reduced vigor  |                    |
| Claypan 12-16        | 10S03W21               | N-S                                  | Hoof imprints during 2004 evaluation indicated use when soils were saturated.                       |                    |
| Claypan 12-16        | 10S03W33               | N-S                                  | Desired perennial grasses dominant. Reduced vigor of grasses in interspaces.                        |                    |
| Claypan 12-16        | 10S03W22               | S-M to N-S                           | Overall, grasses are vigorous with good culm production (2004). Many grasses exhibit crown die-out. |                    |
| Claypan 12-16        | 10S03W25               | S-M                                  | sagebrush stressed  |                    |

| Ecological Site  | Location | RHE Condition <sup>1</sup><br>Biotic | RHE Comments | NPFT Trend |
|--|----------|--------------------------------------|--------------|------------|
| <p><sup>1</sup> N-S = sites departure from reference conditions was either slight, or not apparent.<br/>                     S-M = sites departure from reference conditions was slight to moderate.<br/> <sup>2</sup> These locations sampled in 2004 and 2012. No change in biotic integrity rating between years.</p> |          |                                      |              |            |

Plant Community Integrity

Plant community integrity and native species diversity indicators showed only slight, if any departure from reference conditions. Most sites in the north end of pasture 7N, including the Avery Table and Slack Mountain areas, show none to a slight departure for these indicators and appear to be fully functioning. The exceptions were loamy and claypan sites (10S03W12 & 10S03W12A), where decreaser grasses were less abundant than reference condition. In addition to the expected cool season grass species, site 10S03W12A supported at least eleven species of native perennial forbs in 2012.

The Spencer Butte area is dominated by shallow claypan 12-16 ecological sites with slight to moderate departure from reference conditions, primarily due to a reduction in decreaser grasses. However, decreaser grasses are still dominant and vigorous on these shallow claypan areas. The loamy site (10S03W26) near permanent water within the Lower Avery Place has a lower than expected occurrence of decreaser grasses and Sandberg bluegrass dominates the plant understory.

Annual production at all sites was within the natural range of variation. At some sites annual production was on the low end due to either decreased bunchgrass production or decreased vigor. Shrub productivity was similar to reference areas, except at the loamy site (10S03W26) near the Lower Avery Place where rabbitbrush cover was greater than expected. Legumes (lupine, clover, and milkvetch) were reported at seven of the 17 sites.

Plant Vigor

Plant vigor showed a slight departure from reference conditions. Most sites in the Avery Table and Slack Mountain areas showed none, to a slight departure for this indicator and appeared to be functioning in 2004. Most grasses were vigorous and had adequate seedheads. The exception was a loamy site (10S03W12A), where interspatial decreaser grasses exhibited crown die-out and reduced vigor of in 2004.

The southern portion, between Spencer Butte and the Lower Avery Place, shows a general slight to moderate departure from reference conditions for this indicator. At the Claypan (10S02W29B and 10S02W29A) and Loamy (10S03W26) RHEs, this is primarily due to reduced shrub vigor and shrub decadence. Grasses appear vigorous and reproductively capable.

In 2012, sagebrush and some forb species appeared stressed and defoliation was apparent in over large areas of sagebrush. Of the three areas sampled in 2012, all exhibited depressed vigor. In addition to low plant vigor, field assessments note evidence of aroga moth and poor spring precipitation in the areas.

Noxious and Invasive Weeds

Noxious weeds were not observed. Overall, invasive plants show a moderate departure from reference areas. This portion of the SDR use area has western juniper encroachment occurring throughout the pasture, with juniper encroachment reported at nine of the 17 sites. Japanese brome, cheatgrass, and bulbous bluegrass were also reported at nine of the 17 sites. Overall, invasive plants were found at 12

sites in this pasture. The amount of invasive components varied from common to being found in only trace amounts.

The worst areas of invasive vegetation were found at the following sites: Loamy 10S03W26 (cheatgrass common, juniper trace), Shallow Claypan 10S03W24 (bulbous bluegrass very common and dominant in areas, young juniper trees trace), Shallow Claypan 10S03W12 (bulbous bluegrass common, young juniper trees trace), Loamy 10S03W12A (cheatgrass and bulbous bluegrass minor component, juniper trace), Shallow Claypan 10S03W22 (cheatgrass and bulbous bluegrass minor component), Loamy 10S03W03 (juniper scattered and dominant on upper slope). The areas with the highest departure are near water sources, along access routes, and near private lands.

Two long-term study sites help inform native plant community conditions. Study number 10S02W07 is located in a stony Clayey 12-16 ecological site. Study number 10S02W29A is located in a Shallow Claypan 12-16 site.

### ***Rangeland Trend***

Range condition ratings document poor to fair conditions in pasture 7N in 1982 (USDI, BLM 2014). Those conditions have changed little in some areas, while some improvement is evident elsewhere. The Avery Table area for example, continues to support a low sagebrush / bunchgrass community but the more desirable forage plants (i.e., large bunchgrasses) have continually been under-represented as a group. Meanwhile, the claypan site near Spencer Butte has slowly improved.

The overall trend at the stony Clayey 12-16 site (10S02W07) located on Avery Table has been static to slightly downward since 1983. Sandberg's bluegrass has been the most frequent grass species at the site since 1983 but its frequency has declined gradually since 1995. Although squirreltail has fluctuated since monitoring began in 1983, its trend has been downward since 2004 and the 2012 reading was the lowest on record. Needlegrass and Idaho fescue are minor components of this plant community but they too have either declined or remained static. The only grass species that has increased at this site since 1983 is onspike oatgrass, which increased between the years of 1995 and 2000, and has remained steady since then. Forb readings have been mixed. Phlox frequency rebounded upward in 2012 after substantial declines. Desert parsley has been declining since 2000. Low sagebrush frequency has been static. Photographs support the downward trend data for Sandberg's bluegrass, squirreltail, and needlegrass. The reference-quality plant community known to inhabit the same ecological site 0.4 miles away at RHE 10S02W07B demonstrates the kind of variation in plant community conditions found in this pasture.

The overall trend at the claypan site (10S02W29A) located in the Spencer Butte area has slightly upward since 1983. Three of the five native perennial grass species—bluebunch wheatgrass, Idaho fescue, and onspike oatgrass—have increased, while Sandberg's bluegrass has remained static. Squirreltail demonstrated the same steep decline between the years 1987 and 1995 as the Avery Table site, but has remained static at this site since its partial recovery in 2000. Low sagebrush frequency followed a pattern similar to squirreltail at this site, declining sharply between the years of 1987 and 1995, remaining static since that time. Phlox and desert parsley frequencies also declined between 1987 and 1995. Phlox has not recovered since then but desert parsley has recovered to 1987 levels. Photographs support the static to upward trend illustrated by the frequency data since the early 1980s. Grass and forb cover at the site appears to have either increased slightly or remained static, while shrub cover appears to have decreased. There was no evidence of aroga moth defoliation at this site in 2012. View photos show juniper increasing slightly in the background, but not yet on this site. The RHE

(10S02W29A) at this site showed a slight to moderate departure from reference conditions, with vigorous decreaser grasses dominating the site.

**Standard 7: Water Quality**

**Beneficial Use Support and TMDLs**

The Idaho Department of Environmental Quality (IDEQ) evaluated the beneficial use support status of seven assessment units (groups of streams) within the Sierra del Rio Use Area (Table 20). All seven assessment units are not supporting the cold water aquatic life (CWAL) beneficial use. In addition to the beneficial uses listed, all waters are assumed to support agriculture, industrial water supply, wildlife habitats and aesthetics. However, none of the waters within the Big Springs Allotment have been assessed for these other uses.

**Table 20. Designated and existing beneficial use support status (IDEQ 2003, 2004a).**

| Name<br>(Assessment Unit)   | CWAL              | SS                | PCR     | SCR      |
|---|-------------------|-------------------|---------|----------|
| Camel Creek-1 <sup>st</sup> and 2 <sup>nd</sup> order<br>(ID17050104SW030_02)               | Not Supporting(1) | No Data           | No Data | No Data  |
| Camas Creek-3 <sup>rd</sup> order<br>(ID17050104SW029_03)                                   | Not Supporting(1) | No Data           | No Data | No Data  |
| Pole Creek-1 <sup>st</sup> thru 4 <sup>th</sup> order<br>(ID17050104SW028_02)               | Not Supporting(1) | Not Supporting(2) | No Data | No Data  |
| Deep Creek-4 <sup>th</sup> and 5 <sup>th</sup> order<br>(ID17050104SW026_04)                | Not Supporting(1) | Not Supporting(2) | No Data | Fully(1) |
| Dickshooter Creek-2 <sup>nd</sup> to 5 <sup>th</sup> order<br>(ID17050104SW027_2 through 5) | No Data           | No Data           | No Data | No Data  |
| Nickel Creek-4 <sup>th</sup> order<br>(ID17050104SW031_4)                                   | No Data           | No Data           | No Data | No Data  |

CWAL=Cold Water Aquatic Life; SS=Salmonid Spawning; PCR=Primary Contact Recreation; SCR=Secondary Contact Recreation  
 (1) = IDEQ 2004b (2) = IDEQ 2003 --- = Not Assessed

IDEQ conducted a Subbasin Assessment and Total Maximum Daily Load (TMDL) analysis for 303(d) listed stream segments in the Upper Owyhee River watershed that are located in the Sierra Del Rio Use Area (IDEQ 2003; Table 21). IDEQ then developed TMDLs for five of these streams.

**Table 21. Total Maximum Daily Load (TMDL) Actions (IDEQ 2003).**

| Name<br>(Assessment Unit)   | TMDL Action                       |
|---|-----------------------------------|
| Camel Creek-1 <sup>st</sup> and 2 <sup>nd</sup> order<br>(ID17050104SW030_02) | No TMDL; additional data required |

| Name<br>(Assessment Unit)   | TMDL Action  |
|---|--|
| Camas Creek-3 <sup>rd</sup> order<br>(ID17050104SW029_03)                     | No TMDL; Add to 303(d) list for temperature                          |
| Pole Creek-1 <sup>st</sup> thru 4 <sup>th</sup> order<br>(ID17050104SW028_02) | De-list sediment; Develop TMDL for temperature                       |
| Deep Creek-4 <sup>th</sup> and 5 <sup>th</sup> order<br>(ID17050104SW026_04)  | Develop TMDL for sediment and temperature; list for dissolved oxygen |

### Water Temperature

The subbasin assessment and TMDL process generally addresses only those streams that had been identified on 303(d) listings. The beneficial use support status in Table 22 is based on IDEQ's analysis of water temperature data from various sources. BLM monitored the water temperature of nine stream segments in the Sierra Del Rio Use Area (Maximum Temperature and Maximum Average Temperature, Table 22. Water temperature data were evaluated following IDEQ's 10% exceedance policy and the temperature exemption (See definitions in Glossary, IDEQ 2002 and ID APA 58.01.02).

**Table 22. Stream temperature monitoring of streams in the SDR Use Area of Big Springs Allotment (Deep Creek and tributaries).**

| Stream                                 | Dates Sampled | Max T<br>(°C) | Max Avg T<br>(°C) | CWAL | SS |
|--|---------------|---------------|-------------------|------|----|
| Camel Creek<br>(Mile 0.1 ; Elev 5148') | 7/13-10/03/00 | 27            | 21.4              | NS   | ND |
| (Mile 0.6; Elev 5211')                 | 7/28-8/17/99  | 32            | 20.7              | NS   | ND |
| Pole Creek<br>(Mile 7.8 Elev 5113')    | 7/13-9/24/00  | 23.2          | 22.6              | NS   | ND |
| (Mile 7.9; Elev 5125')                 | 7/29-10/26/99 | 25.2          | 21                | NS   | ND |
| (Mile 9.5; Elev 5158')                 | 7/13-9/24/00  | 26.5          | 24                | NS   | ND |
| (Mile 11.3; Elev 5184')                | 7/28-10/25/99 | 24.1          | 22.2              | NS   | ND |
| Deep Creek<br>(Mile 18.6 ; Elev 4755') | 7/31-10/31/99 | 24.5          | 21.4              | NS   | ND |
| (Mile 23.2; Elev 4814')                | 7/14-10/19/00 | 28.6          | 24.2              | NS   | ND |

CWAL=Cold Water Aquatic Life (water temp. = 22° C or less, with a maximum daily average of < 19° C);  
SS=Salmonid Spawning (water temp. = 13° C or less, with a maximum daily average of < 9° C)FS=Fully Supports beneficial use;  
NS=Does Not Fully Support beneficial use; ND=No Data

The amount of stream channel shading provided by topography (i.e., canyon walls) and vegetation is important in regulating the amount of direct solar radiation that reaches the water surface. While topography generally remains constant, activities that occur in and near the riparian areas may affect the amount and type of vegetation. The potential or capability for a stream system to support riparian shrubs and trees depends on the stream type (gradient, stream bed and bank materials, valley bottom width, flow regime, etc.) and landscape setting. The Upper Owyhee Subbasin Assessment and TMDL (IDEQ 2003) provided target shade requirements for streams in the SDR Use Area for which adequate data were available to model (Table 23). These targets represent the amount of shade needed to comply with water temperature standards and may be refined, based on additional data or site potential.

**Table 23. Upper Owyhee TMDL target shade requirements for select streams in the SDR Use Area, Big Springs Allotment.**

| Stream   | June % Shade<br>(SS Criteria) | July % Shade<br>(CWAL Criteria) | August % Shade<br>(CWAL Criteria) |
|--|-------------------------------|---------------------------------|-----------------------------------|
| Deep Creek (Nickel Creek to Pole Creek)              | 100                           | 58                              | 57                                |
| Middle Deep Creek (2 miles downstream of Pole Creek) | 100                           | 57                              | 57                                |
| Lower Deep Creek (4 miles downstream of Castle Ck)   | 100                           | 66                              | 67                                |
| Upper Pole Creek                                     | 96                            | 96                              | 58                                |
| Lower Pole Creek                                     | 100                           | 65                              | 60                                |
| Camel Creek  | 97                            | 97                              | 62                                |
| Upper Dickshooter Creek                              | 100                           | 100                             | 62                                |
| Lower Dickshooter Creek                              | 94                            | 65                              | 67                                |

SS=Salmonid Spawning; CWAL=Cold Water Aquatic Life

Shade measurements were taken at one site on streams in the Sierra Del Rio use area (Table 24). BLM data were measured with a solar pathfinder and IDEQ data were collected with a spherical densiometer. The solar pathfinder data represent the average daily shade for July (typically the hottest month), while the densiometer readings represent a point-in-time measurement.

**Table 24. Stream shade monitoring on streams in the SDR Use Area, Big Springs Allotment.**

| Stream   | Date    | Shade (%) | Stream Type | Agency |
|--|---------|-----------|-------------|--------|
| Camel Creek (1999SBOIA013)<br>(Mile 0.9; Elev 5200') | 7/26/99 | 02        | C           | IDEQ   |

Stream Type = Rosgen Stream Classification Level I (Rosgen 1996)

## Fecal Coliform

The current maximum standard for primary contact recreation beneficial use designation is 406 *Escherichia coli* (*E. coli*) organisms/100 ml for a single sample and 576 *E. coli* organisms/100 ml for a single sample for secondary recreational contact (IDAPA 58.01.02). Table 25 summarizes BLM monitoring for coliform bacteria. Historical analyses reported only fecal coliform and total coliform counts, rather than *E. coli*.

**Table 25. Coliform bacteria analyses from streams in the SDR Use Area, Big Springs Allotment.**

| Stream  | Date    | Total Coliform | Fecal Coliform |
|---|---------|----------------|----------------|
| Deep Creek (DEEP_00.0)<br>(Mile 0.0; Elev 4470')  | 7/07/77 | 90             | 78             |
| Deep Creek (DEEP_26.1)<br>(Mile 25.5; Elev 4880') | 7/19/90 | No Data        | 20 / 10 (1)    |
| Deep Creek (DEEP_31.6)<br>(Mile 36.1; Elev 5098') | 7/19/90 | No Data        | 100 / 360 (1)  |
| (1) = water/sediment                              |         |                |                |

*E. coli* are one type of fecal coliform bacteria and the data presented in Table 26 include *E. coli*, but the laboratory analyses at the time did not differentiate organisms because the water quality standard was for fecal coliform only (for primary contact recreation the standard was 500 colonies/100 ml and for secondary contact recreation the water quality standard was 800 fecal coliform colonies/100 ml).

## Sediment

Water quality criteria for sediment are determined on a case-by-case basis (IDAPA 58.01.02.250.05). In the absence of specific criteria, sediment shall not exceed quantities that impair designated uses. Streambed sediment was not assessed for most SDR Use Area stream segments.

The Upper Owyhee Subbasin Assessment and TMDL (IDEQ 2003) provided a 27% target for streambed fine sediment (sand/silt/clay) allocation for Deep Creek. This target represents the maximum amount of fine sediment that would accumulate on the stream bottom and still provide for full support of beneficial uses. This target may be refined, based on additional data or site potential.

## Water Chemistry

Table 26 summarizes BLM and IDEQ water chemistry monitoring only for stream segments where beneficial use support has not been assessed. These limited water chemistry data indicate that Deep Creek may experience low levels of dissolved oxygen during periods of low flow when water temperatures are elevated.

**Table 26. Water chemistry monitoring in the SDR Use Area, Big Springs Allotment.**

| Stream                 | Date    | pH  | Conductivity (uS/cm) | Dissolved Oxygen (mg/L) | Instantaneous Temperature (°C) |
|------------------------|---------|-----|----------------------|-------------------------|--------------------------------|
| Deep Creek (DEEP_00.0) | 8/16/76 | 8.1 | 32                   | 8.3                     | 12                             |

| Stream   | Date           | pH        | Conductivity (uS/cm) | Dissolved Oxygen (mg/L) | Instantaneous Temperature (°C) |
|--|----------------|-----------|----------------------|-------------------------|--------------------------------|
| (Mile 0.0; Elev 4470')                             | 10/20/76 11:25 | 7.6       | 26                   | 11.7                    | No Data                        |
|  | 10/20/76 12:15 | 8.0       | 86                   | 9.7                     | 3.8                            |
|  | 4/07/77        | 7.7       | 18                   | 10                      | 8                              |
|  | 7/07/77        | 8         | No Data              | 7.4                     | 15                             |
| Deep Creek (DEEP_014.2)<br>(Mile 11.7; Elev 4686') | 8/12/91        | No Data   | No Data              | 5                       | 24                             |
| Water Quality Standard                             |                | 6.5 – 9.0 | No Data              | >6                      | ≤ 22                           |

### Other Data Reviewed

BLM reviewed the State of Idaho's Beneficial Use Reconnaissance Protocol (BURP) database (IDEQ 2004b). IDEQ uses these data, along with other information, to determine beneficial use support status. BURP data have not been analyzed in further detail in this Assessment.

## **Standard 8: Habitat for Special Status Species**

### **Wildlife**

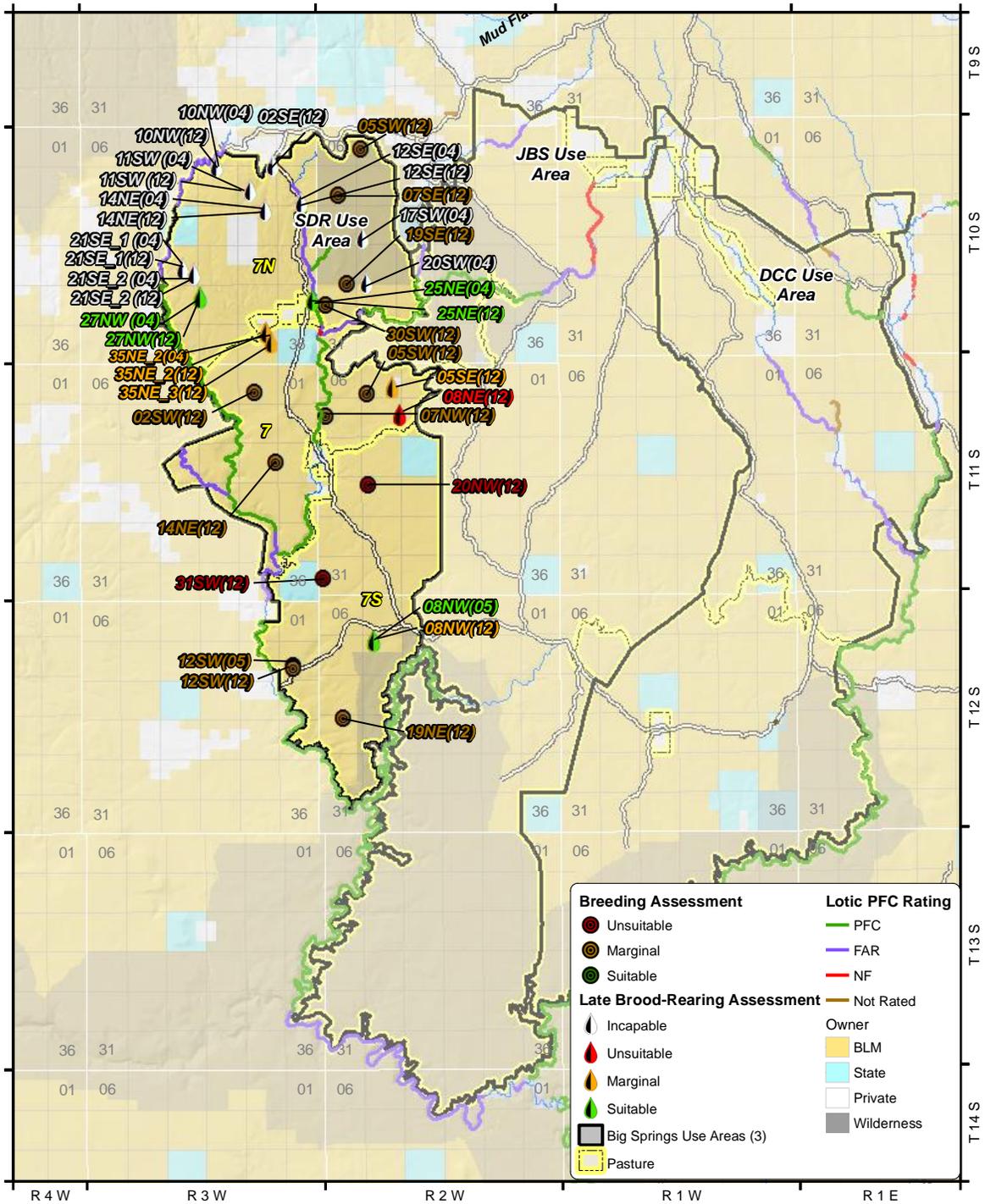
The Sierra Del Rio Use Area is the western most area in this allotment and contains the densest juniper cover, especially in the northern portion. As with the other use areas, low sagebrush/bunchgrass communities comprise the majority of the shrub component. Sagebrush exists as an understory with juniper in the northern portion of the use area and becomes dominant in the southern portion. Overall, habitats in the Sierra Del Rio Use Area are in good to moderate condition (see Fig. 28). Pastures 7N and 7NC (henceforth known as 7N) comprise the northern portion of the use area and although they exhibit juniper encroachment and the presence of other invasive plants (e.g. cheatgrass, bulbous bluegrass), native species compositions are near reference conditions (see Standard 4). The middle portion of the SDR Use Area (Pasture 7) is further from reference conditions than is Pastures 7N and is in moderate condition for wildlife habitat. In the southern portion (Pasture 7S), which is grazed in the spring, the grasses are not as vigorous and provide less cover and forage for wildlife than reference conditions, especially at sites that are not rocky

Streams in this use area are generally in good condition, whereas springs in this use area are in moderate to good condition (see Standard 2). Roughly 70% of the streams and 40% of 14 springs located on public land in this use area were rated as Proper Functioning Condition (PFC). With the exception of 0.1 miles of stream rated as Nonfunctioning (NF), the remaining streams and springs assessed since 2004 were rated as Functioning at Risk (FAR) or did not get assessed. Streams that showed room for improvement included portions of Deep and Camel Creeks in Pastures 7N and 7NC and Deep, Pole, Camel, and Nickel Creeks in Pastures 7 and 7S.

### **Sage-Grouse**

Although much of the northern third of the Sierra Del Rio Use Area contains high juniper cover and is not conducive to sage-grouse use, Avery Table (eastern portion of Pasture 7N) and the remaining portions of the use area are used by sage-grouse. Much of the uplands in the southern two thirds of the

use area are dominated with low sagebrush associated with sporadic stringers of big sagebrush. This area contains five occupied sage-grouse leks and is within three miles of six others (IDFG 2013). Telemetry data collected by IDFG is sparse for this use area but shows a few fall and winter locations, but nesting has been observed near breeding assessment site 10S2W30SW (2012) and likely occurs throughout much of the southern portion of the use area. Figure 8 depicts conditions measured at various locations for sage-grouse across the use area.



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Figure 8. Sage-grouse data for the SDR Use Area

### Pasture 7N (Summer Use)

Much of Pasture 7N is comprised of a juniper overstory with a sagebrush understory. In the presence of higher juniper cover, portions of this pasture are incapable of providing habitat for sage-grouse (see Figure 9). As one moves southward in this pasture, juniper cover decreases and sage-grouse use has been observed. Consequently, this pasture contains an ecotone between sagebrush and juniper-dominated landscapes, along with accompanying sage-grouse use and non-use.



**Figure 9. Representative juniper habitat looking east across Camel Creek drainage toward Avery Table, Pasture 7N (T10S, R3W, Sect. 13), 2004**

Although late brood-rearing assessments were conducted at many springs in this pasture, many were categorized as incapable (see Figure 8) based on the presence of high juniper cover and/or steep topography. These springs were not used to assess Standards and Guides relative to sage-grouse but other deficiencies were noted with the PFC assessments at some of these sites (see Standard 2). Of the 11 areas assessed for suitability as late brood-rearing areas in Pasture 7N, only two were retained to assess relevant to sage-grouse. Both of these sites (one standalone spring and one spring in Camel Creek channel) were rated as suitable in 2004 and 2012 (Table 8). Late brood-rearing sites used by sage-grouse in this pasture are in good condition.

Upland communities in Pasture 7N are in good habitat condition (Table 28), with generally high forb diversity and good native plant components. Given the representative plant composition in areas exhibiting potential nesting habitat (i.e. no or lower juniper cover), assessments were conducted in low

and silver sagebrush sites because of evidence that sage-grouse also nest in low sagebrush (Musil 2011). Ratings at these sites were held to the criteria established for big sagebrush sites so even though most of these areas were in excellent condition, ratings were often skewed downward.

### **Pasture 7 (Late Spring/Early Summer Use)**

Pasture 7 is comprised of more open areas dominated by low sagebrush with decreasing amounts of juniper, in patches, when compared to Pasture 7N (Figure 10).



**Figure 10. Representative habitat roughly one mile south of Dry Lake Spring (boundary of Pastures 7 and 7N), Pasture 7 (T11S, R3W, Sect. 2), 2004**

Pasture 7 contains deep canyons like Pole Creek (below its confluence with Camel Creek) and Deep Creek, where sage-grouse are unlikely to visit during the late brood-rearing period. Areas potentially used by sage-grouse that were assessed include two areas at/near Dry Lake Spring and two springs in Antelope Basin. The two sites at/near Dry Lake Spring and one in Antelope Basin rated marginal, whereas the other one in Antelope Basin rated unsuitable. Although sage-grouse use was evident at most of the sites, hummocking, erosion, and low forb diversity were also common at most sites. Dry Lake Spring was evaluated in 2004 and again re-sampled in 2012, both with the same rating outcomes.

Upland communities in Pasture 7 are in good habitat condition (Table 28), with generally high forb diversity and good native plant components. Three of the four breeding assessments were conducted in low sagebrush sites since that comprises most of the pasture. Ratings at these sites were held to the

criteria established for big sagebrush sites so even though most of these areas were in excellent condition, ratings were often skewed downward.

### **Pasture 7S (Mid-Spring Use)**

Pasture 7S is comprised mostly of low sagebrush with a few isolated juniper and few patches of big sagebrush (Figure 11). One notable larger area of big sagebrush is along Big Point near the Wiseman Crossing of Deep Creek.



**Figure 11. Representative low sagebrush habitat at Big Point, Pasture 7S, Aug. 2, 2005**

With the exception of a few springs, wet areas in Pasture 7S consists of bordering Pole, Deep, and Dickshooter Creeks, all of which generally have canyon or steep characteristics. One small spring (Albert Spring) was assessed for late brood-rearing habitat and found to be suitable in 2005 and marginal in 2012. Sagebrush encroachment observed in 2012 was responsible for the marginal (vs suitable) rating.

As with the other pastures in this use area, most of the upland communities in Pasture 7S are in good habitat condition but comprise vegetation that would not meet the criteria for suitable sage-grouse nesting habitat (i.e. low sagebrush; Table 27). An exception to this rule was the Wyoming big sagebrush area near Wiseman Crossing at Big Point where the area rated marginal in 2005 and 2012 but for different reasons. The transect locations were close but not identical (permanent transects not implemented until 2013 in Bruneau FO) and shrub and forb cover ranged from too low to suitable. During both visits to the area, Sandberg bluegrass was noted as the dominant bunchgrass and low cover was cited as an issue for the site.

**Table 27. Sage Grouse Habitat Evaluations for Sierra Del Rio Use Area in Big Springs Allotment, 2004-2005. (See Table 7 in Section IV., pages 24-25 for indicators and values used to obtain ratings.)**

| Pasture | Site Name   | 04/05 Rating | 2012 Rating | Vegetation                | Season | Rationale for Ratings and Comments  |
|---------|-------------|--------------|-------------|---------------------------|--------|---|
| 7N      | 10S3W27NW   | S            | S           | Wet meadow at spring      | LBR    | Some dry species invading (e.g. juniper) but conditions at spring very good   |
|         | 10S3W25NE   | S            | S           | Spring in stream drainage | LBR    | Camel Creek: forb diversity poor but abundant; sage-grouse sign observed and sage-grouse flushed in 2012                                    |
|         | 10S3W21SE_1 | I*           | I*          | Spring with trough        | LBR    | Little Jackass Spring: spring flow is minimal with some erosion at spring, two small wetland areas at headbox and at trough overflow        |
|         | 10S3W21SE_2 | I*           | I*          | Wet meadow at spring      | LBR    | Jackass Spring: vegetation looks very good and forbs are diverse but naturally unsuitable due to surrounding conifer                        |
|         | 10S3W14NE   | I*           | I*          | Spring with trough        | LBR    | Cougar Spring: Forbs sparse; naturally unsuitable due to surrounding conifer  |
|         | 10S3W12SE   | I*           | I*          | Spring in stream drainage | LBR    | Minor erosion ('04), forbs not diverse but abundant   |
|         | 10S3W11SW   | I*           | I*          | Spring with trough        | LBR    | Bat Spring: Major erosion but forbs available   |
|         | 10S3W10NW   | I*           | I*          | Spring in stream drainage | LBR    | Hillside Spring: Willows in steep draw, site in good vegetative condition but naturally unsuitable  |
|         | 10S3W02SE   | ---          | I*          | Spring with trough        | LBR    | Spring at base of steep slope surrounded by dense juniper; vegetation in good condition but naturally unsuitable due to surrounding conifer |
|         | 10S2W20SW   | I*           | ---         | Wet meadow at spring      | LBR    | No erosion, forbs available   |
|         | 10S2W17SW   | I*           | ---         | Spring in stream drainage | LBR    | Moonshine Spring: High grazing utilization, 1" stubble.   |

|   |             |     |   |                         |          |  |
|---|-------------|-----|---|-------------------------|----------|--|
|   | 10S2W30SW   | --- | M | Low sagebrush           | Breeding | Excellent condition site with high forb diversity but shrub height and cover are marginal; juniper nearby but young sage-grouse chicks observed within roughly 100 yards of transect |
|   | 10S2W19SE   | --- | M | Low sagebrush           | Breeding | Excellent condition site with high forb diversity but shrub height and cover are marginal; juniper nearby but nesting observed at similar site (10S2W30SW)                           |
|   | 10S2W07SE   | --- | M | Silver sagebrush        | Breeding | Good condition site with high forb diversity but shrub height (too short) and cover (too high) at this site are marginal   |
|   | 10S2W05SW   | --- | M | Low sagebrush           | Breeding | Avery Table: excellent condition site with high forb diversity but shrub height and cover at this rocky site are marginal  |
| 7 | 11S2W8NE    | --- | U | Wet meadow at spring    | LBR      | Low diversity of forbs and uncommon, moderate to heavy utilization with heavy livestock impacts and encroaching juniper  |
|   | 11S2W5SE    | --- | M | Wet meadow at spring    | LBR      | Low diversity of forbs but abundant, some hummocking and erosion, sage-grouse scat present   |
|   | 10S3W35NE_2 | M   | M | Wet meadow at spring    | LBR      | Dry Lake Spring: management exclosure gate open and utilization ~ 90% ('04), extreme soil damage; sage-grouse present during both assessments.                                       |
|   | 10S3W35NE_3 | --- | M | Wet meadow at spring    | LBR      | High utilization but with moderate diversity of forbs and sage-grouse present  |
|   | 11S3W14NE   | --- | M | Low & Mtn big sagebrush | Breeding | Excellent condition site with high forb diversity but shrub height and cover are marginal; site represents low sagebrush-dominated landscape with scattered big sagebrush            |
|   | 11S3W02SW   | --- | M | Low sagebrush           | Breeding | Excellent condition site with high forb diversity and forb and grass cover but shrub height and cover at this site are marginal  |

|   |           |     |   |                       |          |  |
|---|-----------|-----|---|-----------------------|----------|--|
|   | 11S2W05SW | --- | M | Low sagebrush         | Breeding | Excellent condition site with high forb diversity and forb and grass cover but shrub, grass, and forb height at this site are less than optimal  |
|   | 11S2W07NW | --- | M | Low sagebrush         | Breeding | Excellent condition site with high forb diversity and forb and grass cover but shrub height and cover at this site are marginal  |
| 7S  | 12S2W8NW  | S   | M | Wet meadow at spring  | LBR      | Albert Spring; graminoid dominated, forbs are not abundant and sagebrush is beginning to encroach ('12)  |
|   | 12S2W19NE | --- | M | Low sagebrush         | Breeding | Excellent condition site with high forb diversity and grass cover but shrub height and cover at this site, as well as forb cover, are less than optimal  |
|   | 12S3W12SW | M   | M | Wyoming big sagebrush | Breeding | Big Point, 0.6 mi. NE of Wiseman Crossing: sagebrush cover rated low in '05 transect but suitable in close but different '12 transect, forb cover suitable in '05 transect but low in '12 transect, grasses are mostly <i>Poa</i> and cheatgrass, too much bare ground for productive site which is likely result of excessive grazing |
|   | 11S2W31SW | --- | U | Rock and Grass        | Breeding | Qualitative assessment of area characterized as big sagebrush in ESD layer: area is primarily rock and grass with only two low sagebrush hits along transect, forbs marginal   |
|   | 11S2W20NW | --- | U | Low sagebrush         | Breeding | Very low shrub cover and height, combined with low forb and grass height, would be unsuitable for nesting; grasses are mostly <i>Poa</i> but grass and forb cover are good   |
| I*=Naturally Incapable due to Juniper, S=Suitable, M=Marginal, U=Unsuitable |           |     |   |                       |          |  |

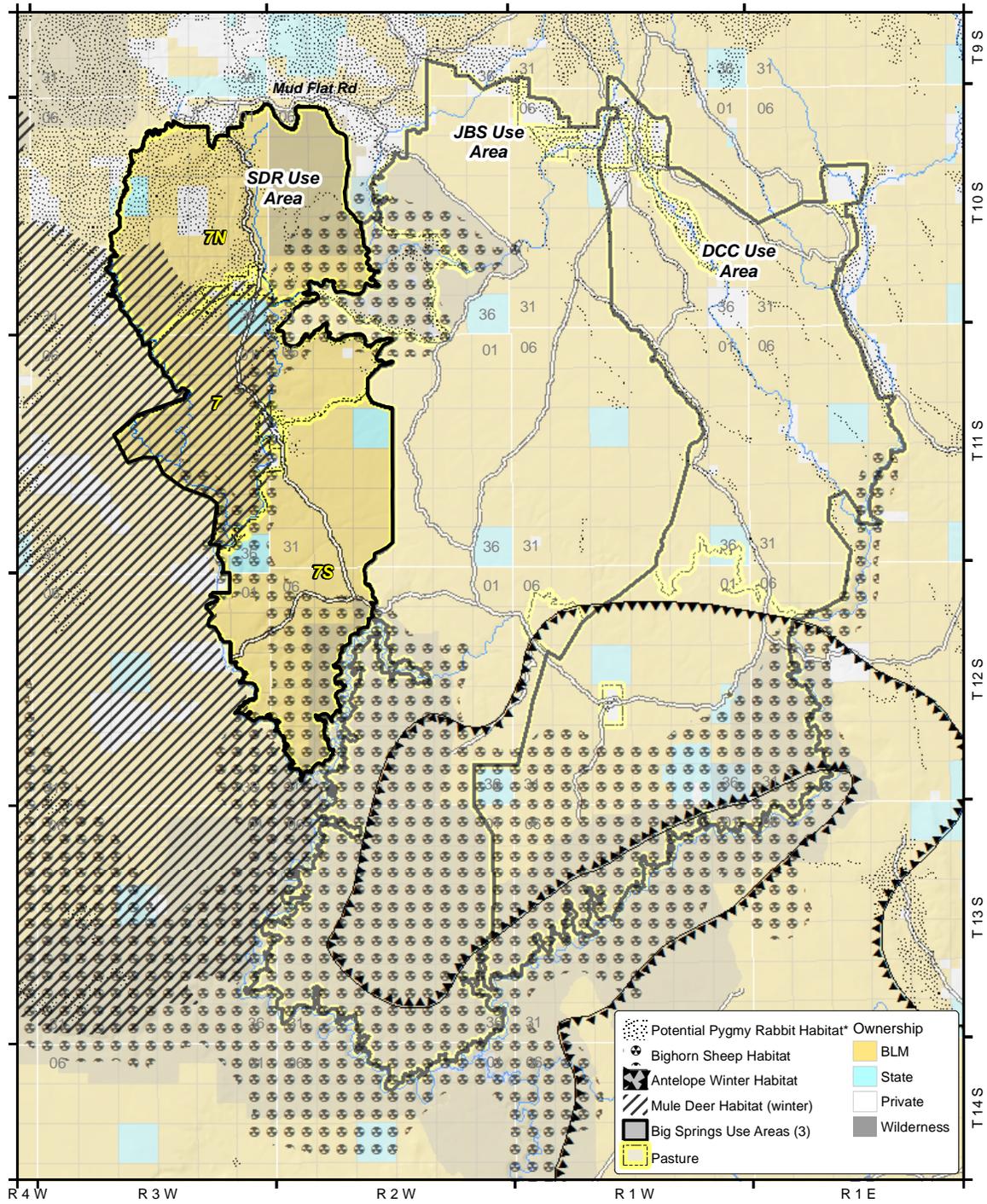
### Columbia Spotted Frog

Columbia spotted frogs have been recorded in Deep Creek, Camel Creek, and Pole Creek, all of which are in, or border, Pasture 7N of the Sierra Del Rio Use Area (IFWIS 2013). There is 0.1 miles of Camel Creek immediately above its confluence with Pole Creek that rated NF. Habitat in this reach is providing degraded habitat for spotted frogs. Other FAR-rated segments in the aforementioned creeks occupied by spotted frogs are also providing less than optimal habitat conditions. Other streams or spring areas in the use area may contain spotted frogs but many were visited for this assessment and nothing besides

tadpoles in a stock tank (likely Pacific treefrog tadpoles) was noted. Since PFC ratings are roughly associated with habitat condition, many of the streams rated as PFC provide suitable conditions for spotted frogs if other habitat requirements are present. Streams exhibiting FAR or below characteristics (i.e. sections of Camel, Deep, and Pole Creeks in or adjacent to Pasture 7N) either prevent use by spotted frogs or could provide better habitat for this species.

### **Pygmy Rabbit**

Pygmy rabbits have not been documented in the Sierra Del Rio Use Area during previous surveys. Analyses of pygmy rabbit detections relative to Ecological Site Description (ESD; NRCS 2012, unpublished draft) showed a logical association of locations with four ESD types. These ESD types represent roughly 7,800 acres (~15% of use area) in the Sierra Del Rio Use Area and were used as a model for potential pygmy rabbit habitat in this assessment (Figure 12). The ESD types correlate roughly with some small cliff areas and relatively dense juniper areas in Pastures 7N and 7. Pygmy rabbits need deep, loamy soils for burrowing but dense juniper and cliffy areas would also provide more hiding habitat for predators compared to more open and flatter areas. Even if pygmy rabbits do occupy some portion of this use area, upland vegetation conditions are good in much of the use area so conditions for pygmy rabbits would be generally suitable.



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Figure 12. Wildlife (except sage-grouse) data for the SDR Use Area

## **Bighorn Sheep**

Bighorn sheep habitat overlaps primarily with the southern half of Pasture 7S north of Dickshooter Creek (Fig. 12). Although the overlap is roughly 13,800 acres, bighorn sheep concentrate near the Dickshooter Creek canyon area so use is not evenly distributed within the delineated habitat. Habitat quality and quantity in the BFO does not appear to be the limiting factor for bighorn sheep since they graze on steeper slopes than cattle, so only localized competition with cattle for forage is possible where cattle can access canyon areas (IDFG 2011). The Owyhee River Population Management Unit, in which the Sierra Del Rio Use Area resides, has exhibited stable bighorn sheep numbers between 250-350 animals since 2006. Upland conditions are good in Pasture 7S where bighorn in this use area reside most of the time, as well as in the corridor and northern portions of the use area in the Pole Creek Wilderness where they occasionally visit. All of the areas delineated as bighorn sheep habitat in this use area are characterized with very low human disturbance.

## **Fish**

Redband trout inhabit Deep Creek in Pasture 7N. Trout densities are low and redband trout were no longer present in Deep Creek at a site located just downstream of Mud Flat road, when it was resampled after initially being sampled in 1977 (Allen et al. 1993, 1998). Of 7.1 miles of Deep Creek inhabited by redband trout in Pasture 7N, 4.0 miles are FAR and as a result, are not providing suitable habitat for the maintenance of viable trout populations.

The cover, density, and composition of streamside vegetation are reduced on about one-half of the segments of Deep Creek supporting trout populations in Pasture 7N. As a result, streambanks are inadequately vegetated to withstand the erosive forces of high stream flows and bank-stabilizing species are often lacking. Unstable streambanks and channels reduced the living space for redband trout and increased the width/depth ratios. Wide, shallow stream channels and lack of streamside vegetation resulted in increased solar heating of streams such that temperatures exceeded State criteria for cold water biota (CWAL) in Deep Creek.

Redband trout inhabit Deep Creek and Pole Creek (downstream of the Camel Creek confluence) in Pastures 7 and 7S. Additionally, redband trout seasonally inhabit the lower portions of Nickel Creek and may also seasonally inhabit Dickshooter Creek. Trout densities in Deep and Pole creeks are low, with redband trout present at one of three sites sampled on Deep Creek in Pastures 7 and 7S at a density of 0.8 trout per 100 m<sup>2</sup> of stream.

Of 24.8 miles of Deep, Nickel, and Pole creeks inhabited by redband trout in Pastures 7 and 7S, 11.3 miles are FAR and as a result are not providing suitable habitat for the maintenance of viable trout populations. The cover, density, and composition of streamside vegetation are reduced on almost all segments that are FAR in Pastures 7 and 7S. Consequently, streambanks are inadequately vegetated to withstand the erosive forces of high stream flows and bank-stabilizing species are often lacking. Unstable streambanks and channels reduced the living space for redband trout and increased the width/depth ratios. Wide, shallow stream channels and lack of streamside vegetation resulted in increased solar heating of streams such that temperatures exceeded State criteria for cold water biota (CWAL) in Deep and Pole creeks.

## **Plants**

There are two special status plant known to occur in the Sierra Del Rio Use Area (Table 28). These include the Owyhee River forget-me-not (*Hackelia ophiobia*), Type 3 BLM Sensitive species, and

Simpson's hedgehog cactus (*Pediocactus simpsonii*), a Type 4 species. Both species are located in Pasture 7S. Special status plants are not presently known to occur on BLM land in Pastures 7 or 7N.

**Table 28. Special Status Plants Known to Occur in the Sierra Del Rio Use Area, with species descriptions and a summary of the conditions of each population.**

| Species                    | Pasture | Habitat   | Status                | # of Populations | Summary of Conditions   |
|----------------------------|---------|---|-----------------------|------------------|---|
| Owyhee River forget-me-not | 7S      | Talus at the base of rhyolitic cliffs and rock crevices on shady north face of canyons. | BLM Sensitive, Type 3 | 1                | 1982-no data, habitat relatively inaccessible.  |
| Simpson's hedgehog cactus  | 7S      | Benches and canyon rims in rocky/stony or sandy soil in low sagebrush habitat.          | BLM Sensitive, Type 4 | 2                | #1. 2005->60 plants, population vigor excellent, site quality assessed as good, area is very rocky and poorly watered, no damaged plants observed.<br><br>#2. 2005- ~30 plants, population vigor was excellent, area is very rocky, population located near a reservoir and salt block but no current disturbance observed. |

Owyhee River forget-me-not has a very restricted habitat that includes well-shaded talus, in cracks and crevices of rocky basaltic bluffs and cliffs, and steep banks of canyons. Because of its restricted habitat this species has little if any competition from other vascular plants and herbivory is not a threat to this species since the deep canyons where it grows are both remote and inaccessible. This population is located in Deep Creek Canyon and has not been recently assessed but it has a very high likelihood of remaining in good condition.

In 2005, two new populations of Simpson's hedgehog cactus were located in Pasture 7S. It was previously unrecorded in this Use Area. This species occurs on rocky or sandy benches and canyon rims. Hedgehog cactus has no specific phenologically "critical" period since it remains above ground all year. Therefore, it is subject to herbivory or mechanical disturbance at any time. Hedgehog cactus is typically resilient to disturbance due to its rocky habitat and its protective spines, which deter trampling and herbivory. The populations discovered in 2005 showed excellent vigor. Both populations were located in very rocky areas. No negative impacts to these populations were observed.